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ABSTRACT

These position reports describe the findings of task forces which focused on the need to translate work-related experience into degree or certificate credit at postsecondary institutions. The eight occupational fields examined included Accounting, Agribusiness, Data Processing, Day Care, Electronics Technology, Management, Police Science and Secretarial Science. A task force delineated each field, identified the measurement needs of individuals and postsecondary institutions, identified and evaluated available instruments and procedures, determined the new instruments and procedures that need to be developed and suggested ways to implement new occupational assessment programs. (Author)

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EXPLORING THE NEEDS FOR COMPETENCY MEASURES IN EIGHT OCCUPATIONAL FIELDS: POSITION REPORTS OF TASK FORCES

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ABSTRACT

These position reports describe the findings of task forces which focused on the need to translate work-related experience into degree or certificate credit at postsecondary institutions. The eight occupational fields examined included Accounting, Agribusiness, Data Processing, Day Care, Electronics Technology, Management, Police Science and Secretarial Science. A task force delineated each field, identified the measurement needs of individuals and postsecondary institutions, identified and evaluated available instruments and procedures, determined the new instruments and procedures that need to be developed and suggested ways to implement new occupational assessment programs.

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EXPLORING THE NEED FOR OCCUPATIONAL COMPETENCY MEASURES

TASK FORCE COMMITTEE POSITION PAPER

ACCOUNTING FIELD

May 21, 1974

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Items submitted to the members of the Task Force for review were: A Placement Testing Program for Private Business Schools published by South-Western Publishing Company and the CEEB's Introductory Accounting CLEP examination. The Task Force was also provided with a typical list of employer job descriptions in seeking personnel which served to illustrate the diversity in demand and the misuse of the term "accounting". (See Appendix A)

DELINEATION OF THE FIELD

After much discussion, the Task Force Committee agreed that all accounting falls within three general categories: governmental accounting, public accounting, and private accounting. The group then identified the following major types or specialized areas in the accounting field: Tax Accounting, Government Accounting, Auditing, Corporate Accounting, Bookkeeping, Small Business and Partnership Accounting. The Committee felt it would be detrimental to de-emphasize related areas in any competency measures. Related areas MUST include data processing as this is an intrinsic part of accounting. Other related areas would include but not be limited to: English, psychology, logic, economics, and office machines; employment positions, however, are usually divided in the following manner:

Accounting Clerk	(knowledge of principles)
Bookkeeper	(knowledge of Intermediate Accounting)
Jr. Accountant	(knowledge of Advanced Accounting)
Sr. Accountant	

As for the future, it was felt that in the accounting field there is a definite growth in industry at present and it will continue, due to the increase in governmental regulations, reports, and more complex tax laws. Examples were cited where colleges have difficulty keeping students enrolled when their education becomes advanced to the point where businesses employ them before their education is complete. Colleges are merely meeting the demand at this point in time, but this condition will vary depending on the nation's economic condition.

IDENTIFICATION OF NEEDS

A competency measurement was seen by the Committee as enabling those with a lesser degree of formal education to be recognized on the employment scene (either to be gainfully employed or to become more valuable to their present employer) since an employer tries to relate how an individual's "experience" can be utilized within the corporate enterprize.

The importance of a competency examination such as the CPA was stressed. What is learned at a collegiate institution is often difficult to relate to a job or to practical application. Many of the problems and tasks faced by the young worker in any organization cannot be simulated in the classroom. The theories learned provide a basis for understanding business but the motives of people seeking certification are professionally related; that is, they are looking for something which relates specifically to their job! The desire is for something which demonstrates ability to learn; as a result, industry feels it has a better investment.

The B. A. degree frequently serves as an entry to the field and represents exposure to the field. For those with a lesser degree of formal education it is important to have their competency measured so they might pursue a degree or have an incentive created to further their formal education. The group noted that educational refunds from employers are usually available for formal schooling - this promotes education that is job oriented.

The typical route for an individual pursuing the accounting field is: 2-year graduate, 4-year graduate, CPA. CPA firms are degree oriented and the banking industry still looks to the B. A. for initial employment, but promotions are tied to certification.

IDENTIFICATION OF NEEDS Continued

Most accounting firms, when dealing with new hires, examine the candidate's transcript in an attempt to evaluate the student's potential for performance in real-life situations. To the degree possible, the recruiter tries to become familiar with the faculty and the approach used in their courses. Many accounting majors, for example, have been exposed to CPA-oriented courses of study, while business and industry's need is for people who understand the industrial accounting approach.

Formal education and work experience are usually weighed 50-50 by the prospective employer; since training of employees is a very expensive item for a company an occupational competency measuring tool would be invaluable. Students attending college who are placed in on-the-job training programs and for which the school gives credit definitely have an advantage over others as industry recognizes this practical application of knowledge when the employee enters the labor force after receiving his degree.

Realizing the value of continuing education, business and industry view the availability of a competency measurement as an incentive for the employee to grow and upgrade himself. That incentive and the paid tuition of most organizations would both be beneficial to institutions in terms of generating enrollment and financial support for higher education.

It was the consensus of the group, however, that the Task Force focus its attention on competencies below the level of the CPA. Thus, while four-year degrees are important, so are certificates. To be considered adequate in all areas of one's

IDENTIFICATION OF NEEDS Continued

field and assured of the highest priority on the employment scene both are necessary.

The total labor force in the United States, according to Department of Labor figures, presently stands at 86.5 million persons. Eleven percent are minorities and 34 percent are women. When considering further education after high school graduation, time, accessability, and cost are the three most important factors weighed by people in the work force.

The importance of the incentive potential was stressed. The four-year degree would be attainable if individuals could by-pass certain basic classes by being given credit with an occupational competency measurement tool. As a result, credit for occupational experience measured by a standard, nationally available, instrument would provide an incentive for individuals to pursue further education; thereby generating college enrollment and placing individuals into the main stream of personal growth and continuing education. Moreover, credit by examination for work-related experience would bring a segment of society into the classroom whose plans are more stabilized than those just out of high school. It is clear that educational growth will, in the future, not be limited to youth - but to persons of all ages.

Due to the Affirmative Action Program, entry into businesses is occurring at a lower skill level. A lack of qualified candidates for higher level positions may be due to training deficiencies, population make-up, lack of interest, or a number of other problems. A survey by the American Society for Personnel Administration indicates that 92% of the companies are actively involved in ways to attract a wider range of qualified personnel.

IDENTIFICATION OF NEEDS Continued

There appears to be a strong demand for managerial accounting, and management is looking to accounting for a greater role in decision making; there will be a definite need for more highly skilled people coupled with widespread use of computers and limited opportunity for the un-trained individual.

The Committee also felt that there is a definite need for students to have a more realistic view of business operations so they could better relate their preparatory work to the various accounting fields and acquire an understanding of where each position fits into the field.

Business, industry and college instructors should have a closer relationship with each other; educational instruction in the accounting field needs to be broadened. Individuals need to be prepared to be employed in smaller communities and in smaller companies as well as the larger corporations.

IDENTIFICATION OF AVAILABLE RESOURCES

Affirmative Action Program - Contact Office of Federal Contract Compliance
Department of Interior
Denver Federal Center
Denver, Colorado

Mr. Gerald Williams

for reporting format.

AIB - American Institute of Banking

AMS - Administrative Management Society - has C.A.M. (Certified Administrative Manager) examination

American Hospital Corporation, Evanston, Illinois - grants certification describing proficiency in hospital accounting.

AACSB - 760 Office Parkway, Suite 50, St. Louis, Missouri 63141 -
Contact: Dr. Cyril Ling - Sets up structure program for colleges and universities.

CICPA - Colorado Institute of Certified Professional Accountants -
Contact: Russ Beam, Metropolitan State College, Denver, Colorado

Commerce Clearing House - The Task Force Committee believes they sponsor seminars and refresher courses in accounting.

CPA - Certified Public Accountant - The Task Force Committee believes the examination

IDENTIFICATION OF AVAILABLE RESOURCES Continued

is academic, based on theory, and predicts auditing knowledge capabilities. The Task Force Committee currently believes the CPA exam is not a complete measurement for competency in the accounting field.

DPMA - Data Processing Management Association

Equal Employment Opportunity Commission

ETS - Educational Testing Service, Princeton, New Jersey

Kaiser-Carnegie Plan - grants certificates for achievement, clerical through management fields.

Life Office Management Insurance Corporation -

NBA - National Banking Association

Office of Economic Opportunity -

Phi Beta Lambda - is for post-secondary students. Students have developed competency test. Contact: Miss Georgine Lynch
Colorado State President
Phi Beta Lambda
1420 Carteret
Pueblo, Colorado 81004

Mr. Russell DeVriendt
Sponsor, Phi Beta Lambda
State Board for Community Colleges
and Occupational Education
Room 207, State Services Building
1525 Sherman Street, Denver, Colorado 80203

IDENTIFICATION OF AVAILABLE RESOURCES Continued

Prentice Hall Publishing Company -

Psychological Corporation of New York -

Institute of Internal Auditors, Inc., 5500 Diplomat Circle, Orlando, Florida 32810

Contact: Mr. Robert E. Rivers, CIA
Director of Certification

IIA is an international organization with a membership exceeding 8,100 dedicated to the advancement of the profession of internal auditing. One of the major objectives has been the promotion of contacts and exchange of information among members.

The organization sponsors the Certified Internal Auditor program; publishes research reports on policies and practices of modern internal auditing, and such topics as electronic data processing, statistical sampling, inventory control, organizational control and the behavioral sciences.

The Internal Auditor, the Institute's bimonthly technical journal, contains feature articles and specialized material specific to the field of internal auditing; it keeps members and subscribers informed of current developments in the philosophy and practice of internal auditing as applied to actual business operations.

In addition, the Institute publishes books on the latest techniques and developments in internal auditing.

IDENTIFICATION OF AVAILABLE RESOURCES Continued

A continuing program of seminars, workshops and lectures conducted by the Cadmus Education Foundation of the Institute, along with annual area and international conferences, serve to keep the internal auditor "on top" of the latest developments in techniques and practices in the field. Ultimately, the Foundation might develop a series of courses leading toward an accepted educational standard for professional recognition of internal auditors.

The objective of internal auditing is to assist all members of management in the effective discharge of their responsibilities, by furnishing them with analyses, appraisals, recommendations and pertinent comments concerning the activities reviewed. This involves going beyond the accounting and financial records to obtain a full understanding of the operations under review.

An internal auditor has no direct responsibility for nor authority over any of the activities which he reviews. The organizational status of the internal auditing function and the support accorded to it by management are major determinants of its range and value. An internal auditor should not develop and install procedures, prepare records, or engage in any other activity which he would normally review and appraise. Ideally, the internal auditor is staff on an organizational chart.

The Code of Ethics to which a member of the Institute of Internal Auditors, Inc. subscribes is that a member shall have an obligation to

IDENTIFICATION OF AVAILABLE RESOURCES Continued

exercise honesty and loyalty in all matters pertaining to the affairs of the employer and shall maintain the high standard of competence which the Institute of Internal Auditors, Inc. and its members have established.

NAA - National Association of Accountants, 919 Third Avenue, New York, New York 10022

Contacts: Wm. Young, Executive Director
J. Vavasour, Managing Director

Founded in 1919, and is the largest management accounting association in the world with 67,000 members and 285 chapters. Members are men and women from every professional and industrial group occupied or interested in some phase of accounting. Membership is open to all persons interested in advancing their knowledge of accounting.

NAA has established the Institute of Management Accounting to implement and administer the CMA (Certificate in Management Accounting). It has many publications available including: "Certificate in Management Accounting Examination" - December 1972 - Questions and Unofficial Answers. Designed to help candidates prepare for future examinations, the answers in this publication were prepared by experts in the fields covered by the examination.

Other publications include "The Role of the Accountant in the 70's" by Elmer B. Staats - The Comptroller General of the United States presents his views regarding the role of the accountant in the years ahead; "Toward A Basic Accounting Philosophy" by Raymond P. Marple - Selected writings over a period of 30 years focusing on the need for better understanding of

IDENTIFICATION OF AVAILABLE RESOURCES Continued

accounting and its concepts. Sets forth discussion to which other concepts can be related and includes a wide range of accounting topics which contribute to knowledge as well as understanding in the field.

NAA also provides a Continuing Education Program (CEP) which provides detailed classroom instruction in concepts and techniques and their application to planning, control and decision making.

INSTRUMENTS CURRENTLY AVAILABLE

CIA - Certified Internal Auditor - sponsored by Institute of Internal Auditors, Inc. A Common Body of Knowledge for Internal Auditors was adopted by the Board in June, 1971. This study outlines the knowledge areas in which internal auditors should show proficiency in order to attain competency in their chosen profession.

Candidates for the CIA Program must meet educational and experience requirements, subscribe to a Code of Ethics and pass a written examination of four parts.

To be eligible to sit for the Certified Internal Auditor examination, each candidate must submit satisfactory evidence of the following qualifications:

1. A baccalaureate degree from an accredited college-level institution. (An official transcript or, if not available, written proof of completion of the degree program shall be submitted.)*

   *This requirement shall be waived until June 1, 1978. Academic qualifications submitted by candidates in other countries should be outlined in sufficient detail to enable the Regents to determine equivalency. The Board of Regents shall be the sole judge of the acceptability of educational attainment offered in lieu of a baccalaureate degree.

2. A minimum of three years work experience in internal auditing

INSTRUMENTS CURRENTLY AVAILABLE Continued

as of the date of sitting for the examination.

3. A statement of work history attested by a CIA or member of the candidate's management who is familiar with his work.

4. Applicants must subscribe to a Code of Ethics and submit a character reference from either a Certified Internal Auditor or a member of his company management.

When all requirements have been satisfactorily met, the candidate will be notified of the Board of Regents' approval to sit for the examination.

The four parts of the written examination a qualified candidate must successfully pass to attain the designation "Certified Internal Auditor" are:

Part I - Principles of Internal Auditing

Part II - Internal Audit Techniques

Part III - Principles of Management

Part IV - Disciplines Related to Internal Auditing

The subject matter of the examination is developed each year under the supervision of the Board of Regents. The Institute through the Cadmus Education Foundation provides a recommended study program and offers seminars to aid applicants in preparing for the exam.

INSTRUMENTS CURRENTLY AVAILABLE Continued

Examinations are given annually on the same date in locations throughout the world.

A candidate must sit for at least two parts of the examination at his initial sitting. He may elect to take all parts at a single session and he may repeat those parts which he has failed. Failure to pass all four parts within a span of three consecutive examinations shall disqualify a candidate; however, the candidate may reapply for consideration at any future date.

(This examination has not been pretested. City, County, government employees at regional level will be tested during the summer of 1974.)

CLEP - College Level Examination Program - sponsored by College Entrance Examination Board - has an "Introductory Accounting" subject examination. This examination deals with materials that are comparable to the content of a one-year course in financial accounting that includes basic managerial accounting topics or one semester each in financial accounting and managerial accounting. It covers accounting concepts and terminology, the preparation and use of financial reports, the application of accounting techniques to simple problem situations, and the rationale for generally accepted accounting principles and procedures. However, the Committee felt that the language used is probably unfair for a competency measurement in non-traditional study.

INSTRUMENTS CURRENTLY AVAILABLE Continued

CMA - Certificate in Management Accounting - sponsored by National Association of Accountants - Contact: Dr. James Bulloch, Director
Institute of Management Accounting
City Center Building
Ann Arbor, MI 48108

Telephone: (313) 662-1986

Admission to the Institute's program requires applicant to satisfy ONE of the following conditions:

1) Hold a baccalaureate degree
2) Achieve a score satisfactory to the Credentials Committee of the Institute on either the Graduate Record Examination or the Admission Test for Graduate Study in Business
3) Be a Certified Public Accountant or hold a comparable professional qualification outside the United States that is approved by the Credentials Committee.

The Examination consists of the following five parts:

1) Economics and Business Finance
2) Organization and Behavior, including Ethical Considerations
3) Public Reporting Standards, Auditing and Taxes
4) Periodic Reporting for Internal and External Purposes
5) Decision Analysis, Including Modeling and Information Systems

Each CMA candidate may request a list of suggested reading material. The exam is given in June on an annual basis. It is a 17½ hour, 3 day, timed

INSTRUMENTS CURRENTLY AVAILABLE Continued

examination. Candidates must pass all five parts of the certificate examination within a consecutive three-year period and have completed, prior to or within seven years of having passed the certificate examination, two years of related professional experience in management accounting.

To retain certification the individual must complete an average of 30 hours a year of professional study in each three-year period subsequent to passing the examination.

The objective is to maintain the professional competence of the individual and the Institute of Management Accounting encourages all forms of continuing education and methods of instruction consistent with the above requirement. Programs may involve college courses, seminars, workshops or technical meetings under the direction of an instructor. There must be formal instructional and training material. On-the-job training does not qualify. Not more than 50% of the required hours may be fulfilled by employer-conducted programs. Credit for hours of study may be given for technical articles published in business, professional or trade journals, and for major technical talks given for the first time before business, professional and trade organizations. Specific hours of credit will be determined in each case by the Institute. A broad range of subjects may be included in the programs for which hours of credit will be given. Illustrative of the subjects which may qualify are: management accounting, mathematics and statistics, computer science, economics, finance, management, production, marketing, business law and behavioral science.

INSTRUMENTS CURRENTLY AVAILABLE Continued

The certificate may be retained permanently without meeting the continuing education requirements when the Certificate holder has reached the age of 55 or has held the certificate for 30 years.

South-Western Publishing Company, Cincinnati, Ohio - Has available a Placement Testing Program for Private Business Schools.

Phase I - tests terminology as well as accounting knowledge.

Phase II - tests knowledge of trial balance, work sheets, and financial statements.

SUGGESTED PROCEDURES FOR IMPLEMENTATION

Uniform standards need to be established and predetermined by educators, specialists, and/or people knowledgeable and interested in the various accounting areas. The Task Force was in agreement that the vehicle used for assessment should be administered and maintained by a private agency and not the federal or state government.

The competency measurement should be geared to a junior accountant with a minimum of two levels (possibly more should be made available for individuals who would be two-thirds or three-fourths of the way toward a formal degree) and must be related to the college curriculum in order that institutions will give credit.

A sample test, a list of terms with definitions, and guidelines for each examination should be provided for optional use by the potential candidate in advance of his actually sitting for the examination.

The examinations should clearly identify the several parts or segments and each should be based on the predetermined levels of difficulty. Specifically, a competency measurement in the field of accounting should include:

1) Financial statement interpretation
2) Accounting procedures (1) general accounting procedures
   (2) cost accounting procedures
   (3) electronic data processing (EDP)

   (Processing cost control would be included in the above
3) Accounting (General) principles or theory (Includes Principles I, II, and Intermediate)

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

4) Financial planning or budgeting (cash flow) including accounting techniques in general management.
5) Auditing techniques (Mainly internal, external would be associated with advanced techniques)
6) Taxes
7) Governmental Accounting (Knowledge of governmental accounting procedures)

In general, the Task Force agreed that any assessment program should include the knowledge and skills necessary to develop and record the daily series of transactions in a business, depreciation methods, solving problems, developing balance sheet, financial statement, cash control, accounts payable (including payroll), analysis of statements, accounts receivable, inventory control, control of assets, data processing (particularly in-put data), processing cost control of raw materials, should all be measured in the competency exam. Other skills to be tested should include math and multiplication 7 through 12, proof reading of numbers and alphabetized names, how to look for errors, use of 10-key adding machines, calculators (specifically electronic), and basic touch typing.

The format of the test should include essay and multiple choice questions, true and false items, case studies and in-basket exercises.

The Committee was very much concerned with the type of terminology to be used in designing the competency measurement. It was emphasized that the terminology should be versatile and not connected with a single specific publishing company. Both old

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

and new terminology should be used and perhaps all of the various terms applicable to a specific definition should be used in each statement so student could identify with the one with which he is familiar. It was felt individuals may know the definition of a term but not recognize it when a terminology unfamiliar to them is used. i.e., Profit and Loss Statement - Income Statement

Balance Sheet - Financial Statement

Wording of questions, choice of words, and terminology are all clues to making the test simple so that all candidates have equal opportunity.

The Committee was very emphatic about endeavoring to maintain an on-the-job environment at the testing center and the climate of activity to relate to on-the-job experience so the test operation would not be foreign to the candidate. Candidates should have the option of using equipment available at the center or bringing their own.

In testing for competency, individual should be free to use any of the various methods as long as the end result is the same; however, in exam he should also be tested as to whether he knows there are optional methods. i.e., he should be free to set up his own preferential style in development of balance sheet; use his preferred method of depreciation; or perhaps given a number of invoices and asked how he would set up on books (example - prepaid insurance).

Endorsement of the competency measurement by such agencies as the National Association for Accrediting Business Schools, the AACJC (American Association of Community and

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

Junior Colleges), and possibly the NAA, needs to be secured if the program is to fulfill its promise and make the greatest impact on people now in or entering the nation's work force.

TASK FORCE POSITION PAPER

AGRICULTURAL ECONOMICS

July, 1974

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The task force experienced considerable difficulty in delineating the field of Agricultural Economics as it relates to the assessment and accreditation of life experiences. The field originally chosen for study by the task force was Ag-Econ and members of the committee were chosen for this specific field. However, preliminary definitions of this area of agriculture revealed that the field does not ordinarily include a significant range of occupations which are experience based. The task force members indicated that the field of Ag-Econ was perhaps not the most appropriate for translation to academic credit inasmuch as (a) the term tends to refer to an academic discipline rather than a vocation or occupation, and (b) people who could be labeled "agricultural economists" tend not to be those in need of crediting for life experience since they either already have higher degrees or are working at a level of achievement that makes further certification unnecessary.

The committee members then determined that the area of agriculture which includes the greatest range of experience-based occupational competencies suitable for assessment and accreditation procedures was that of Agricultural Business. For some members of the committee, however, the field of Agri-Business, like Ag-Econ, identifies an occupational level too high to have a significant need for academic crediting procedures. Furthermore, Agri-Business tends to be a broad term, referring to a composite of skills and roles relating primarily to the management of people, rather than specifically to management of agricultural resources. In this sense, Agri-Business does not differ significantly from other business occupations, hence should probably not be defined as a separate occupational field.

In an attempt to more clearly define the field, members of the committee identified three primary areas into which the field of agriculture can be subdivided: (1) Farm and Ranch Management, (2) Supply of Agricultural Resources (Materials and Services), and (3) Marketing of Agricultural Products. Each of these areas is associated with a number of different occupations. However, the three areas are somewhat distinct and provide a useful starting point in determining the scope of the task force study.

At this point, members of the task force focused on the type of person who might wish to take advantage of a procedure for crediting life experiences. It was concluded that the proposed crediting procedure would probably not be attractive to the adult farmer who has been working in the field for a number of years. Such an individual would gain little from a college degree since the development of his or her enterprise is production oriented (raise crops, sell machinery, sell crops, etc.) and not likely to be influenced by academic credentialing. Furthermore, the field of agriculture, through extension services, 4-H programs, corporate training programs, etc., tends to place a high value on training and continuing education, yet rarely associates this training or education with formal academic programs. The task force members generally felt that while these training and education programs have met with varying degrees of success, they are an important, vital segment of the agriculture field and should not be potentially disrupted by introducing a secondary emphasis on academic crediting.

It was agreed that the primary population to be served by the proposed crediting procedure is the 18 - 22 year old student who comes to college with a background in agriculture. The college age student will

benefit significantly from crediting for life experience, because it could either reduce his or her total time in college or allow him or her to take a greater number of advanced agriculture courses or elective courses in other disciplines. Furthermore, the college-age person entering the field of agriculture will find a greater need for professionalization in many of the agricultural occupations. The advance of consumer protection concerns has created a demand for credentialing and licensing procedures particularly in areas of safety control (e.g. pesticide and fertilizer applications). There is also a growing emphasis on the need to have management personnel who are knowledgeable in basic agricultural practices.

If the college-age person is the focal client for this program, then the field should be delineated on the basis of the types of experience that this person is likely to have acquired before entering college. Members of the task force, having accepted this premise, decided that Farm and Ranch Management is an appropriate initial focus for the proposed crediting procedures. The student with a background in agriculture is most likely to have acquired his experience on a farm or ranch, rather than from having worked in a supply or marketing capacity.

The committee members were able to define three different clusters of educational requirements for workers on farms and ranches. One cluster includes "hands-on" skills (e.g., farm machinery, carpentry, livestock selection and classification, and welding). A second cluster of educational requirements were conceptual in nature, (e.g. crop sciences, economics, and animal sciences). The third cluster consists of unique, upper-level requirements of a special variety, (e.g. independent studies and research based on individual objectives). The first two sets of

requirements could be met by the young person entering a community college with extensive farm and/or ranch experience. The conceptual skills can be assessed by means of paper and pencil tests, whereas the hands-on skills would probably require performance-based testing.

The future outlook for farm and ranch management is difficult to project inasmuch as the entire agricultural industry is affected by a wide variety of circumstances (e.g. fuel shortages, minimum wage, consumer buying habits, etc.). The task force predicts a reduction in the number of hand laborers and unskilled marginal workers to be replaced by fewer, more highly trained workers on all levels.

The task force spent a great deal of time discussing issues related to the need felt for life-experience crediting procedures. In general, colleges and universities probably do not currently experience any significant pressure to develop crediting procedures for students in the farm and ranch management field. As these colleges and universities experience an increased number of vacancies, however, there may be a greater demand for such procedures given the need to attract students who might otherwise find a college education unobtainable because of limits on available time and money. Furthermore, if the crediting procedure enabled students to learn more, or to move through college in a shorter period of time (cf. the Carnegie Commission's report entitled "Less Time/More Options"), then the college or university will have more effectively met its primary mission of providing inexpensive, quality education. As mentioned in the previous discussion, task force members did not perceive a need among adults already practicing in the field for college credit. However, the college age student is more likely to want this procedure, and would probably seek out these services if they were made readily available and were extensively promoted.

To provide further information concerning the need for crediting in this field, staff members sent out questionnaires to colleges throughout the 13 western states serviced by WICHE (see appendix for copy of questionnaire and summary of results). The questionnaire asked if a crediting arrangement would be acceptable to those institutions and if so, for what types of experience and to what extent. The returns indicated that there was support for crediting procedures, though the support seemed rather tentative and somewhat limited. This response may be attributed at least in part to the tentative nature of the questionnaire. A second questionnaire was sent out to agricultural business firms asking if credits acquired through this procedure would be accepted as equivalent to traditionally acquired credits. The return from this questionnaire was small, hence not very definitive.

In general, the task force indicated that there was some need for crediting procedures in the farm and ranch management field, but did not compile any compelling evidence to justify extensive expenditure of either time or money for this project. On the other hand, members of the task force did identify several possible sources of funds, including the Farm and Industrial Institute in Chicago and the American Farm Bureau Federation.

The task force members recommended that a combined performance-based and paper-pencil test procedure be developed, with possible regional or state options for implementing the performance-based testing. Task force members also emphasized that any crediting arrangement must not detract from (a) a strong tradition of continuing education, without academic crediting, which currently encourages colleges and universities to involve themselves with the community rather than promoting reliance

on traditional college enrollment and certification, and (b) an emerging emphasis on cooperative education, whereby students become involved not only in an academic evaluation program, but also in an apprenticeship, on-the-job experience that brings greater vocational relevance to bear upon the total educational experience.

APPENDIX A

Questionnaire Results

The attached questionnaire was sent to a sampling of colleges with agricultural programs throughout the 13 western states serviced by WICHE. The questionnaire reflects the tentative nature of the task force in process and was intended to serve as a tool for suggesting possible directions for the task force committee.

Questionnaires were returned by the following institutions:

Brigham Young University
California State University, Chico
California State Polytechnic University, Pomona
California Polytechnic State University, San Luis Obispo
Mesa Community College
New Mexico State University
Oklahoma State University
Shasta Community College
University of California, Davis
University of Idaho
Utah State University
Washington State University

The academic (professional) responsibilities of most respondents were related primarily to training and research.

The following is a breakdown of the responses to items 2, 3, 4, and 5 indicating the number of responses given to each item. A summary of the answers given to discussion questions are included in the final section of this appendix.

- - -

2) If a nationally-recognized procedure was developed by a reputable testing firm for assessing competencies in the field of agriculture, do you think that your institution would be willing to grant academic credit for demonstrated competencies if these competencies were related to course work.

1 a) Yes, my institution/department already has established procedures for crediting occupational competencies (please attach any descriptions you may have of this procedure at your institution).

6 b) Yes, I firmly believe that my institution would accept credit, up to a maximum of approximately _____ semester/quarter hours. (see discussion summary)

5 c) Yes, provided that the following conditions were met: (see discussion summary)

0 d) No, my institution would not accept credit for experience-based competencies.

2 Other responses (included in discussion summary).

Appendix A (contd.)

3) What kinds of experience-based competencies would your institution consider for accreditation?

8 a) occupational experience

5 b) industrial training programs

2 c) peace corps or vista

5 d) other (please specify) (See summary of discussion answers)

4) What kinds of assessment procedures would your institution accept as valid measurements of the necessary knowledges, skills, and abilities?

9 a) paper and pencil tests

8 b) performance tests

1 c) non-test measures (e.g. checklists and portfolio evaluation)

3 d) other (please specify) (See summary of discussion answers)

5) In what ways do you think your institution would be willing to encourage the development of accreditation-for-experience procedures?

9 (See summary of discussion answers)

Appendix A (contd.)

Summary - Discussion Answers

2(b) The maximum number of credit hours which responding institutions indicated they would be willing to accept for occupational competencies ranged from six to thirty. One university indicated that it was possible for students to obtain three semester hours in each sub-area (except for mathematics) based on test scores. Other respondents describe similar procedures throughout the questionnaire.

2(c) Responses to this question indicate that the main concerns of the respondents were that the testing procedures be valid and cover a breadth of valid occupational experiences in which the student would apply theoretical as well as practical expertise. Another repeated concern expressed was that of departmental control and autonomy in the application of crediting procedures.

Other responses to this item showed a hesitation to make an individual evaluation concerning a matter which might involve the entire institution. One of the individuals polled answered each section of the questionnaire in this manner.

3(d) Additional responses to this question show a willingness to consider a variety of experience-based competencies for credit provided those competencies are relevant and are appropriately supervised or in accordance with predetermined standards of performance. One respondent mentioned that they would consider course work taken in professional organizations such as the American Society of Farm Managers and Rural Appraisers.

4(d) Additional responses to the question of acceptable assessment procedures included a written report from the applicant as to the educational experiences he believes to have acquired through occupational experiences. A written report would also be required from the applicant's employers as to the capabilities and competencies displayed by the individual. Two other respondents stated that no policies regarding this question had been established by their institutions.

5 Answers to this final question regarding institutional willingness to support credit-for-experience procedures seem to reinforce several of the main responses given throughout the questionnaire. Most of the institutions polled expressed willingness to accept and encourage such procedures within certain limits. There was frequent mention of departmental control in the form of student internships or work-study programs. Many of the respondents indicated that credit granted for experience-based competencies would be applicable only to elective courses or some of the beginning required

Appendix A (contd.)

Summary - Discussion Questions

5. (contd)

courses but could not be used to replace core curriculum.

The majority of respondents stated that procedures were already in effect at their institution by which a student is allowed to obtain credit for experience-based competency. Mention was made of the "Challenge System" by which a student can challenge a course which he feels he has already mastered through experience in the field. He is tested by the department and given credit in accordance with his test performance.

One respondent showed particular interest in developing accreditation procedures for former Peace Corps workers who are experienced in the field of international agriculture.

EDUCATIONAL TESTING SERVICE

"PLANNING THE DEVELOPMENT OF MEASUREMENT AND EVALUATION SERVICES FOR USE IN OCCUPATIONAL PROGRAMS AT POST-SECONDARY INSTITUTIONS"

A POSITION STATEMENT OF THE TASK FORCE ON DATA PROCESSING

A Report of the Meetings Held on
February 21-22 and March 28-29, 1974
Princeton, New Jersey

Background

The Educational Testing Service was awarded a grant by the Fund for the Improvement of Post-Secondary Education of the U.S. Office of Education to explore the need for approaches to assessment of competency and work experience in various occupational fields for the purpose of granting college credit. Eight task forces representing different occupational fields were assembled, including a task force on data processing.

The general function of the task force on data processing was to explore the ways in which work-related experience in data processing could be translated into degree or certificate credit. The tests, procedures, and services which might evolve from the recommendations of the task force could prove to be of benefit to individuals who have acquired technical knowledge in a non-traditional manner and desire to obtain formal recognition for their experiences in an institution of higher education.

The task force on data processing was invited to participate in two two-day meetings at ETS to delineate the field of data processing, to identify needs, resources, and competencies in the field, and to determine the desirability of new assessment procedures. This report summarizes the discussion at the sessions held on February 21-22 and March 28-29, 1974 at the Henry Chauncey Conference Center in Princeton, New Jersey. Because the task force discussions were free flowing and loosely structured, this report is a summary of principal issues and conclusions, rather than a detailed account of the discussion process. Tape recordings of the sessions are on file at the ETS project offices.

Participants

Present at the meetings of the task force were the following participants:

Mr. John J. Dineen
Chairman of Computer Science
Middlesex County College
Edison, New Jersey 08817

Mr. Marc A. Goldberg
Manager of Education
Control Data Institute
105 Madison Avenue
New York, New York 10016

Mr. Fred H. Harris*
Director of the Computation Center
University of Chicago
5640 Ellis Avenue
Chicago, Illinois 60637

Mr. Jerry L. Houston
Education Consultant
IBM Corporation
10 Astor's Lane
Port Washington, New York 11050

Mr. Ronald V. Hunter
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Mr. Arthur M. Kroll, Task Force Chairman
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Mr. Keith S. Reid-Green*
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Mr. Robert C. Wear**
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*attended first session only
**attended second session only

Delineation of the Field of Data Processing

In an effort to delineate the field, the task force confronted two concerns: (1) a need to analyze the specific occupations subsumed under the "data processing" rubric and (2) a need to outline the "body of knowledge" in which practitioners receive training. The task force spent considerable time on the former analysis of job ladders and lattices in the field. Mr. Hunter submitted for review by the task force an outline of the primary occupations subsumed under the "data processing" rubric. The outline relied somewhat on Philip H. Weber's Position Descriptions for Data Processing Personnel prepared and published in 1973 by A.S. Hansen, Inc. After careful examination of the matrix of interrelationships of identifiable occupations in the data processing field, the task force arrived at consensus regarding the occupational groupings presented in the following outline.

Occupations in Data Processing

I. Managers

- A. Director of Data Processing
  - 1. Manager of Systems
    - a. User Systems Manager
    - b. Internal Systems Manager
  - 2. Manager of Programming
    - a. User Programming Manager
    - b. Internal Programming Manager
  - 3. Manager of Operations
    - a. Computer (tabulating) Operations Manager
    - b. Input Operations Manager
    - c. Scheduling/Control Manager

II. Systems Analysts

- A. User Systems Analyst
  - 1. Scientific/Engineering
    - a. Systems Trainee
    - b. Jr. Systems Analyst
    - c. Sr. Systems Analyst
  - 2. Commercial
    - a. Systems Trainee
    - b. Jr. Systems Analyst
    - c. Sr. Systems Analyst

B. Internal Systems Analyst

1. Systems Trainee
2. Jr. Systems Analyst
3. Sr. Systems Analyst

III. Programmers

A. User Programmer

1. Scientific/Engineering

a. Programmer Trainee
b. Jr. Programmer
c. Sr. Programmer

2. Commercial

a. Programmer Trainee
b. Jr. Programmer
c. Sr. Programmer

B. Internal Systems Programmer

1. Programmer Trainee
2. Jr. Programmer
3. Sr. Programmer

IV. Operations Personnel

A. Computer Operator

1. Console Operator

a. Trainee
b. Jr. Console Operator
c. Sr. Console Operator

2. Minicomputer Operator

a. Trainee
b. Operator

B. I/O Operations

1. Input Device Operator (keying, optical scanners, data poolers)
2. Tabulating Machine Operator (collating, interpreters, sorters)
3. Data Librarian (tapes, cards, discs)
4. Output Device Operator (microfilm devices, off-line printers, plotters, bursting, decollating)
5. Remote Job Entry Operator

C. Scheduling/Control Personnel

V. Specialists

A. Marketing/Sales

B. Evaluation

C. Educators

1. Formal educational programs

2. Corporate-financed educational programs

3. Vendor-financed educational programs

D. Communications Network Specialist

E. Data Processing Forms Designer

F. Manufacturing Control Specialist

G. Data Base Specialist

The task force felt that most persons desiring academic credit for their work experience would come from the ranks of systems analysts and programmers. Consequently, most of the discussion focused on those two groups of occupations.

Further attempts to delineate the data processing field focused on the "body of knowledge" called "computer science" in which data processing professionals receive instruction. Mr. Harris and Mr. Dineen, in particular, stressed their belief that this field of knowledge could be "mapped" adequately and that consensus could probably be achieved regarding appropriate instructional elements.

There seemed to emerge in the task force discussion, a belief that there is a common core of knowledge that should be known by everyone working in the field. This core area should be tapped first in any competence assessment program. Mr. Dineen used a model of a tree with many branches. The trunk or core material is shared by all the branches.

Curriculum 68* was mentioned as a good example of a curriculum which advanced the state of the art in computer science instruction. Current curricula typically reflect more adequately job requirements in business and industry, although instruction may still lag by several years the "state of the art" in the field.

Mr. Dineen introduced the following ACM quotations in an effort to help define computer science as a discipline:

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*The Curriculum 68 report contains recommendations on academic programs in computer science which were developed by the Curriculum Committee on Computer Science of the Association for Computing Machinery. The report presents a classification of the subject areas contained in computer science and describes twenty-two courses in these areas. Prerequisites, catalog descriptions, detailed outlines, and annotated bibliographies for these courses are included. The curriculum outline with subsequent updating serves as a foundation for most of the computer science programs presently offered in U.S. colleges.

"Computer science is concerned with information in much the same sense that physics is concerned with energy; it is devoted to the representation, storage, manipulation and presentation of information in an environment permitting automatic information systems. As physics uses energy transforming devices, computer science uses information transforming devices. Some forms of information have been more thoroughly studied and are better understood than others; nevertheless, all forms of information--numeric, alphabetic, pictorial, verbal, tactile, olefactory, results of experimental measurement, etc.--are of interest in computer science.

"Mathematics, too, is concerned with information and its structure and this tends to confuse those not well versed in both mathematics and computer science. The mathematician is interested in discovering the syntactic relation between elements based on a set of axioms which may have no physical reality. The computer scientist is interested in discovering the pragmatic means by which information can be transformed to model and analyze the information transformations in the real world. The pragmatic aspect of this interest leads to inquiry into effective ways to represent information, effective algorithms to transform information, effective languages with which to express algorithms, effective means to monitor the process and to display the transformed information, and effective ways to accomplish these at reasonable cost."[1]

Also introduced for discussion was a chart outlining the core courses and prerequisite structure of courses as presented in Curriculum '68. This chart is reproduced on the following page.

Mr. Goldberg and Mr. Dineen also discussed in detail the curricula of their respective institutions. Program outlines for these curricula are appended to this report. In general, it appeared that consensus could be achieved regarding the essential knowledge components of data processing occupations, and that these components might yield specifications for any examinations that might be developed.

The importance of adequate job analysis as a preliminary step to competency assessment, whether for degree credit or certification, was emphasized. A test must be clearly job-related if it is to be useful as a standard of proficiency. It appears, however, that persons in data processing with similar job titles may have widely disparate job tasks and functions. Consequently, it may be impossible to measure competency in the data processing field with a single measurement device. There may be a need to develop specialty tests or levels to serve adequately the variability of jobs in the field. For example, it is generally recognized that the job of a scientific programmer is very different from a business programmer, and a common exam would do justice to neither.

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[1] Communications of the ACM, Volume 8, Number 9, September, 1965, p.544.

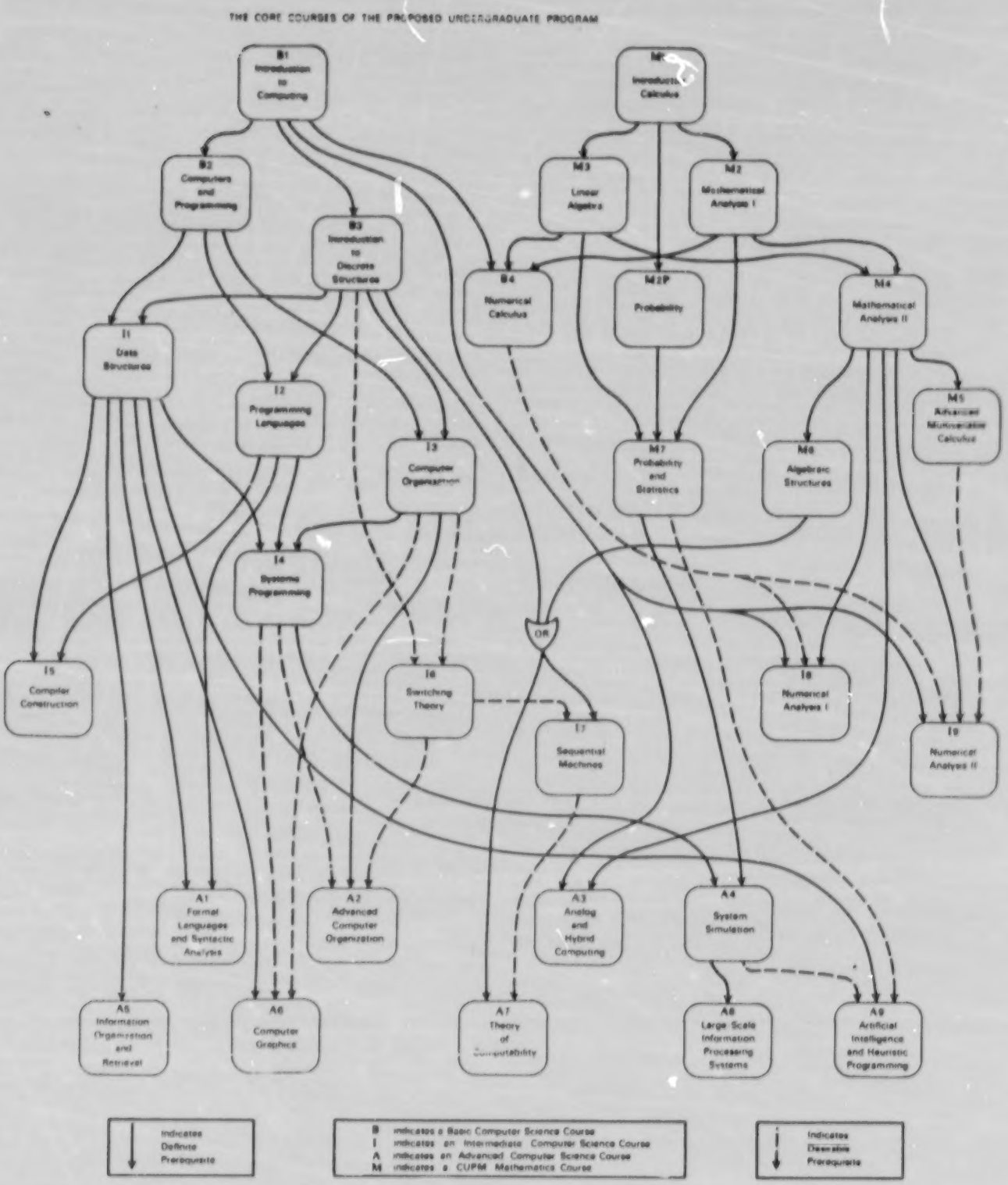
THE CORE COURSES OF THE PROPOSED UNDERGRADUATE PROGRAM
B1 Introduction to Computing
B2 Computers and Programming
B3 Introduction to Discrete Structures
M1 Introductory Calculus
M3 Linear Algebra
M2 Mathematical Analysis I
B4 Numerical Calculus
M2P Probability
M4 Mathematical Analysis II
M5 Advanced Multivariable Calculus
I1 Data Structures
I2 Programming Languages
I3 Computer Organization
M7 Probability and Statistics
M8 Algebraic Structures
I4 Systems Programming
OR
I5 Compiler Construction
I6 Switching Theory
I7 Sequential Machines
I10 Numerical Analysis I
I9 Numerical Analysis II
A1 Formal Languages and Syntactic Analysis
A2 Advanced Computer Organization
A3 Analog and Hybrid Computing
A4 System Simulation
A5 Information Organization and Retrieval
A6 Computer Graphics
A7 Theory of Computability
A8 Large Scale Information Processing Systems
A9 Artificial Intelligence and Heuristic Programming
Indicates Definite Prerequisite
B indicates a Basic Computer Science Course
I indicates an Intermediate Computer Science Course
A indicates an Advanced Computer Science Course
M indicates a CUPM Mathematics Course
Indicates Desirable Prerequisite

FIG. 1. Prerequisite structure of courses

Future outlook for the field looks good. Because of the proliferation of minicomputers, programmers will increasingly be working alone or on very small teams, rather than in large computer centers. Reaching persons working in such environments will be difficult since many of them do not join professional associations. Entrance into the field will continue to be through diverse routes. As small businesses acquire small computers, typically one employee will be reassigned to responsibility for operation and maintenance of the computer, as compared with employment of a graduate from a specific training program.

Short-term retraining and continuing education opportunities will become available. Community colleges are already offering such services to neighboring businesses and industries.

Identification of Assessment Needs in Data Processing

Although the primary purpose of the task force was to analyze the need for assessment procedures to be utilized in evaluating competency and work experience for the purpose of granting academic credit in post-secondary institutions, the task force discussion reviewed assessment needs in data processing more generally. These recognized needs may be categorized as follows:

a. Assessment for guidance and career planning

The field would be strengthened if some form of guidance or selection tests were available that would assist in admitting the more promising candidates from an applicant pool for a course of study and redirecting those persons less qualified into other fields of work.

b. Placement into appropriate levels of instruction

Students enter instructional programs in data processing at different levels of readiness and prior preparation. Institutions providing instruction in data processing would benefit from assessment procedures that would help them identify each student's prior experience and thereby enable them to place students in appropriate courses or levels. These procedures would be diagnostic and prescriptive in nature.

c. Selection for employment

Employers would benefit from some means of differentiating among job applicants on the basis of their skills and job knowledge. For some employers, a competency test focusing on attainment of a particular knowledge level would be useful. Still others would be interested in determining relative levels of aptitude, or the capacity to benefit from on-the-job training.

d. Recognition of a professional elite

Some data processing professionals are interested in procedures for identifying and publicly recognizing an elite corps of particularly competent persons, perhaps reflecting no more than 3-4% of the incumbents in the field. Precedents exist in other fields, such as accounting, psychology, etc. Such recognition would lead toward greater professional status, greater range in salary structures, and the like.

e. Granting of degree credit

Some persons have acquired considerable skill and knowledge in data processing via non-traditional means. For example, veterans wishing to continue their education upon leaving the armed forces often find they are unable to obtain academic credit for the training they received under military auspices. Similarly, adults who have received on-the-job training in business and industry sometimes encounter difficulty in translating the knowledge and experience acquired in this way into academic credit--or into some form of advanced placement. The type of assessment required here would parallel in an occupational area the purpose served in academic domains by the College Level Examination Program (CLEP) distributed by the College Entrance Examination Board.

f. End-of-course achievement measures.

A need exists in institutions providing data processing instruction for a means of assessing instructional outcomes. Achievement tests to determine the effectiveness of teaching and learning would appear to have considerable utility.

g. Self-assessment for continuing education

Persons working in the data processing field have differing opportunities for remaining current with state-of-the-art developments. Consequently, some persons find their skills becoming obsolete. The data processing field would benefit by making available self-assessment procedures whereby individual workers could assess their knowledge and competency in comparison with their peers or against some established criterion of basic competency. Such a procedure might serve as a motivational device to encourage some workers to pursue continuing education opportunities.

h. Employer development of skills data banks

Some employers may have a use for assessment procedures that would help them assess the varied skills of their data processing staffs. Such procedures might result in more effective manpower utilization, promotion policies, compensation policies, improved in-service training and personnel development, and the like.

Mr. Harris encouraged the task force to recognize that these assessment needs were interrelated and simply represented dimensions or facets of a general assessment problem, and that their solution might rest in a comprehensive assessment implementation plan.

Mr. Kroll stressed the need in this project to focus on assessment for granting degree credit for work experience. Mr. Dineen pointed out that most community colleges offering data processing instruction faced the problem of granting such credit or permitting advanced standing. He added that each college determines its own policies and occasionally develops its own tests. He has developed his own tests for such use at Middlesex County College.

The task force had no direct knowledge of the extent of this problem, i.e. how many students in the United States would seek such credit for data processing experience, or how many institutions might utilize common examinations if they were available.

Identification of Available Resources

There was general agreement that very few standardized tests were available in the data processing field. Of the few that are in use, most are aptitude measures designed to screen for promising trainees. Two CLEP subject matter examinations, Elementary Computer Programming: Fortran IV and Computers and Data Processing, were briefly reviewed. Both are achievement-type examinations and are somewhat dated.

The Certificate in Data Processing Examination and the Qualified COBOL Programmers Examination, both offered currently by the Institute for the Certification of Computer Professionals, were mentioned as the only achievement-based competency tests currently available.

Both Mr. Dineen and Mr. Harris mentioned the likelihood of numerous locally developed tests being available. Mr. Harris suggested that such local test developers might be called upon to contribute test items to a central item pool from which new assessment instruments might be developed. Much discussion focused on the desirability of such an item pool, from which items could be drawn to assemble tests of the variety of types mentioned above.

ETS maintains a Test Collection which attempts to assemble review copies of both published and unpublished tests in use in the United States. Staff of the Test Collection were asked to conduct a search of its files and of pertinent literature to ascertain the availability of tests used in the data processing field. This search confirmed the task force's belief that very few standardized achievement tests are now available for use in data processing. The results of the Test Collection search are also appended to this report.

Assessment Procedures

Although interactive, computer-managed testing via remote terminals was introduced by Mr. Reid-Green, there was a general feeling that the assessment needs being discussed had to be met initially by paper-and-pencil devices. The tests would be identified clearly as tests of job-related knowledge--not of job performance.

The domains of knowledge to be tested remain to be identified. Differentiated levels of expected knowledge related to different job levels and areas also remain to be specified.

Any assessment instruments developed would require regular monitoring and updating, since the data processing field is changing rapidly. For example, the task force was critical of the fact that the CLEP examinations referred to earlier are now somewhat obsolete and require revision.

The task force was of varying opinion as to how "current" an examination should be, given the fact that instructional programs and general awareness may lag the "state-of-the-art" by several years. Should adequacy or competency reflect the "state-of-the-art" or current practice in most work settings? Should a person who is performing effectively in a somewhat obsolete computer center be penalized because his work setting has not permitted his expertise to be advanced?

Suggestions for Implementation

The task force was in agreement that the professional associations in the data processing field should assume leadership in the development of assessment procedures for the field and that the Institute for the Certification of Computer Professionals might serve as the appropriate organizational entity to manage such developments, since the Institute already represents a majority of the relevant professional associations. The Institute for the Certification of Computer Professionals was incorporated in July 1973, to, among other functions, "formulate and administer testing and evaluation programs designed to determine the aptitude, level of knowledge, and competence of individuals engaging in or desiring to engage in disciplines directly related to applied computer and information science, in the interest of promoting and encouraging higher and improved standards of competence of such individuals for the benefit of the industry and of the public." Among the charter member candidates of the Institute were the following associations:

Association for Computing Machinery, Inc.
Association of Computer Programmers and Analysts, Inc.
Association for Educational Data Systems, Inc.
Automation 1 Association
Canadian Information Processing Society Limited

Data Processing Management Association, Inc.
The Computer Society of the Institute of Electrical and
Electronics Engineers, Inc.
The Society of Data Educators, Inc.
Society of Certified Data Processors, Inc.
Society of Professional Data Processors

Although not all of the above have become charter members of the Institute, the Institute does represent a majority of the professional associations in data processing and probably is politically best situated to encourage usage of whatever assessment programs might be developed.

Sources of possible funding for development of data processing assessment procedures were discussed. The Department of Labor, U.S. Office of Education, private foundations, the National Science Foundation, and major computer manufacturers were all mentioned as possible sources of support.

Test development and other psychometric support services might be provided by organizations experienced in those areas. The Institute would serve as a focal point for professional input into the assessment development but test construction and administration might well be managed by a service agency such as ETS.

It was generally felt that a comprehensive assessment program might become self-supporting after a period of four or five years of start-up subsidies.

Issues Requiring Further Deliberation

The task force had neither the time nor sufficient representation from the field to resolve all of the issues related to the development of occupational competency measures. Unresolved issues, including but not limited to the following, will warrant further consideration and discussion if the assessment program being analyzed here is to be developed.

1. Competencies to be identified and assessed

   The task force appeared to feel that assessment procedures should focus on job-related knowledge, i.e. knowledge of tools and techniques, and not on actual job performance. Tests would measure knowledge--not competency. It was pointed out that such tests are only able to predict potential quality of performance and not actual performance. The assumption is that without the basic tools, a worker cannot perform well, but, given adequate job knowledge, he may or may not perform well. Thus, basic job knowledge is a "necessary but not sufficient" condition for satisfactory job performance.

   An essential task, then, is to define more precisely what constitutes this basic core of knowledge that must be attained. Can industry-wide consensus be attained on this matter?

2. Necessary job analysis activities

An adequate occupational competency measure must be job-related, i.e. it must be based on properly executed job analyses. Such job descriptions must be sufficiently detailed to permit extraction of skill and knowledge requirements.

Will the AFIPS job analysis project currently underway yield descriptive analyses adequate for the development of assessment procedures?

3. Establishing standards of performance

What will constitute an adequate standard of performance in a given data processing occupation? Should such standards be based on a criterion level established by persons knowledgeable and experienced in the field, or should they reflect a normative survey of the performance of persons currently considered as performing adequately at their jobs? What measures of job performance exist against which test results could be validated? What organization or group should establish the performance standards? What political problems will emerge if significant numbers of persons to be tested fall short of the established performance standard?

Professional standards ideally need to come from people who are active in the field, but who in the field should be involved? Academicians, computer scientists, practitioners, managers? One's professional standing should be assessed against one's peers. What constitutes a "peer group" in the data processing occupations? Given the lack of census-type data on data processing workers, who would determine what constitutes a representative sample?

4. Obtaining universal industry acceptance

Any assessment program in the data processing field probably will be successful only if it obtains nearly universal industry acceptance. Data processing is a highly politicized field and has been characterized by many interest groups and fractionation of professional societies. Any certification or competency measures will require ratification by all represented groups. Is it realistic to believe that all groups will cooperate in a common program? Does the Institute for the Certification of Computer Professionals represent adequate industry representation? Can a professional society or consortium of societies establish standards for a field in which so many practitioners are not currently members of those societies?

5. Determination of minimal job skill and knowledge requirements

Job requirements are usually quite flexible and reflect the characteristics of the available labor pool at a given point

in time. Ample evidence exists of the effectiveness of job simplification and job enrichment procedures. Adequate job analyses should reveal skill and knowledge requirements. However, it is not uncommon in professional upgrading efforts to require education and training levels beyond what is essential for adequate job performance. Motivations for such requirements are complex and often highly political. It seems crucial that minimum competency measures adequately reflect accurate levels of ability, training, experience, etc. as revealed by job analysis and not be based on some society's or committee's arbitrary judgment. A common belief in most occupations is that "standards are not high enough" when in reality satisfactory occupational performance does not require more demanding restrictions.

6. Clarifying the goals and purpose of assessment

The task force meetings revealed a variety of perceptions of the need for and potential function of assessment in data processing. Any assessment programs to be developed should be supported by clearly stated philosophical and conceptual rationales. These foundation statements should be highly credible and motivational to persons who will eventually participate in the assessment to be undertaken.

7. Access to occupational entry positions

Is it reasonable to expect "professionalism" in an occupation which has no prescribed routes of entry, apprenticeships, etc.? Many data processing workers have acquired their knowledge and skills through self-study and on-the-job training. Entry level occupations are still open to persons with no formal training. Given the great variation in training and education patterns for systems analysts, programmers, and other data processing workers, is it realistic to expect consensus on competency measures in the near future?

Conclusions and Recommendations

The Task Force on Data Processing has identified several needs with respect to assessment of occupational competency in the data processing field and makes a number of recommendations for meeting those needs:

1. There will continue to be a strong demand for workers in data processing during the next decade, and workers will continue to enter the field by various routes. A significant proportion of current and future data processing workers will not have degrees and thus will likely seek opportunities for continuing education.

2. Community colleges and other post-secondary institutions have now and will continue to have a need for a means of determining the occupational proficiency of experienced data processing workers who desire to convert their work experience into degree credit or advanced standing. There are no available instruments for effectively serving this need.

3. A comprehensive examination development program should be initiated under the auspices of the Institute for the Certification of Computer Professionals.

   The program should be designed to meet several of the assessment needs outlined earlier in this paper. These tests should be of a paper-and-pencil nature and should focus on job-related knowledge.

4. Given the complex political structure and the data processing field and its associated professional societies, careful advance planning will be required to assure acceptance of the eventual program.

Prepared by

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May 1974

APPENDIX A

MIDDLESEX COUNTY COLLEGE
COMPUTER SCIENCE CURRICULUM

		Lec.	Lab.	Cr.
SEMESTER I				
ENG-121	ENGLISH I	3	0	3
HED-101	HEALTH	1	1	1
PED	PHY-ED ELECTIVE	0	2	1
MAT**	MATH-ELECTIVE	3	0	3
CSC-101	DATA PROCESSING	3	3	4
CSC-*	INTRO TO COMPUTER SCIENCE	2	3	4
	SEMESTER TOTALS	12	9	16
SEMESTER II				
ENG-122	ENGLISH II	3	0	3
PED	PHY-ED ELECTIVE	0	2	1
MAT**	MATH-ELECTIVE	3	0	3
CSC*	DATA STRUCTURES	3	3	4
CSC-152	INTRO TO COBOL	2	3	3
CSC*	ASSEMBLY LANG. I	2	3	3
	SEMESTER TOTALS	13	11	17
SEMESTER III				
------	SOCIAL SCIENCE ELECTIVE	3	0	3
--------	FREE ELECTIVE	3	0	3
CSC-*	ASSEMBLY LANG II	2	3	3
CSC-227	ADV. A.N.S. COBOL	2	2	3
CSC-***	MANAGEMENT INFORMATION SYSTEMS	2	2	3
	SEMESTER TOTALS	12	7	15
SEMESTER IV				
--------	SOCIAL SCIENCE ELECTIVE	3	0	3
--------	FREE ELECTIVE	3	0	3
CSC-*	OPERATING SYSTEMS	3	0	3
CSC-240	STUDENT DESIGN PROJECT	2	3	3
CSC ***	ADV. PROGRAMMING TECHNIQUES	2	3	3
CSC-***	JOB CONTROL LANG-LABORATORY	0	3	1
	SEMESTER TOTALS	13	9	16
	SENIOR YEAR TOTALS	25	16	31
	FRESHMAN YEAR TOTALS	25	20	33
	CURRICULUM TOTALS	50	36	64

APPENDIX B

CONTROL DATA INSTITUTE

1974 PROGRAMMING TECHNOLOGY COURSE
GENERAL COURSE OUTLINE

DATA PROCESSING CONCEPTS — 50 Hours

1. Introduction to Computers
2. Data Input Preparation Equipment
3. Computer Mathematics
   --binary, octal, hexadecimal
   --subtraction, addition
4. Flowcharting and Problem Solving
5. Basic Parts of a Computer
6. Arithmetic and I/O Control Section
7. Programming Language Concepts

REPORT PROGRAMMING GENERATOR AND BUSINESS CONCEPTS — 100 Hours

1. File Concepts
2. Introduction to RPG
3. Report Writing
4. Introduction to System/3
5. Application Programs
6. Introduction to Business Concepts

SYSTEM/360-370 ASSEMBLY LANGUAGE PROGRAMMING — 150 Hours

1. Basic Assembly Language
2. Instruction and Operation
3. I/O Features
4. System Monitor and Special Features
5. Introduction to System/360
6. Introduction to System/370
7. Introduction to Operating Systems (DOS,OS,VS)

FORTRAN PROGRAMMING — 50 Hours

1. Introduction to FORTRAN
2. Arithmetic Statements
3. I/O Statements
4. Functions and Subprograms
5. Project Documentation

COBOL PROGRAMMING — 130 Hours

1. Introduction and History of COBOL Language
2. Structure of the COBOL Language
3. File Access Concepts
4. Update Concepts
5. Report Writing Concepts
6. Advance COBOL Techniques
7. ANSI COBOL Statements

SYSTEMS DESIGN — 70 Hours

1. Introduction to Systems Analysis
2. Systems Study
3. Initiation of a Systems Study
4. Development of Systems
5. Implementation of Systems
6. Evaluation of Systems
7. Interview Techniques
8. Remote Batch Processing
9. Data Base Management
10. Data Communications Concepts
11. Transaction-Oriented System
12. Hardware State of the Art
13. Software State of the Art

PROFESSIONAL DYNAMICS

1. Lecture, Testing, and Grading Techniques
2. Professional Preparation
3. Social Development
4. Career Goals
5. Interview Techniques
6. Resume Writing
7. Office Protocol

1974 PROGRAMMING TECHNOLOGY COURSE
COURSE DESCRIPTION

DATA PROCESSING CONCEPTS — 50 Hours

This section is an introduction to stored program concepts, peripheral storage devices, and data input preparation equipment. Data definitions, codes, and number systems (octal and binary) are also introduced with the students learning to convert numbers of one base to numbers in another base. Flowcharting (micro, macro, absolute and system) and problem-solving techniques are taught using the case study approach. Concepts of system data flow, addressing, indexing, and instruction formats as well as load and store, arithmetic, and branching instructions are taught using a typical general purpose computer.

REPORT PROGRAMMING GENERATOR AND BUSINESS CONCEPTS — 100 Hours

The student learns the System/360 RPG language. With the language the student is introduced to business concepts that will be programmed in RPG. An introduction to System/3 is also taught.

SYSTEM/360-370 ASSEMBLY LANGUAGE PROGRAMMING — 150 Hours

This is an assembly language course in which students learn to write programs in ALC, the System/360-370 assembly language. The course covers hexadecimal arithmetic, the System/360 assembly language instruction set, I/O operations, branching and editing techniques, and debugging methods. System/360 file access methods are also taught.

SYSTEMS DESIGN — 70 Hours

In this section system design concepts and development are taught beginning with an initial study of a manual system. Multiprogramming and multiprocessing concepts, real-time and timesharing system development are explained. Information retrieval, management operating systems, data base structures, and communications systems are introduced. Students also learn the history and development, as well as applications of, remote processing systems.

FORTRAN PROGRAMMING 50 Hours

This section is an introduction to formula translation and transposition. Problem-solving techniques used to solve scientific problems are taught using the FORTRAN language. Such features of the language as DO loops, arrays, and IF statements are explained. ANSI FORTRAN is also discussed.

COBOL PROGRAMMING 130 Hours

In this section the students learn to solve business data processing problems, such as inventory and payroll problems, using the COBOL language. The course includes a presentation of all basic COBOL features. The course concludes with a discussion of USASI COBOL and a study of three different applications of existing COBOL systems.

PROFESSIONAL DYNAMICS 50 Hours

This course is designed to provide the student with the personal development information needed by a technical student to acquire and perform effectively on his future job. Information received includes effective study habits, personal attitudes and motivation, human relations, preparing resumes and letters of application, participating effectively in interviews, and appropriate on-the-job conduct.

APPENDIX C

DATA PROCESSING TESTS IDENTIFIED BY STAFF OF ETS TEST COLLECTION

Aptitude Assessment Battery: Programming by Jack M. Wolfe; c1967; Age: Adults; Programming Specialists, Inc.

> Designed for use with programmers and programmer trainees. Distribution is restricted to employers of programmers.

Aptitude Test E51 for Electronic Data-Processing Programmers; c1958-62; Age: Adults; National Cash Register Company.

Card Punch Operator Aptitude Test by W.J. McNamara; c1952; Age: Adults; International Business Machines Corporation.

> Designed for the selection of prospective trainees of IBM card punch equipment. Permission to use the test must be obtained from IBM office in Trenton.

Certificate in Data Processing Examination; c1962-present; Age: Adult; Data Processing Management Association.

> The examination covers: automatic data processing equipment, computer programming and software, data processing systems and management, and quantitative methods.

College Level Examination Program: Subject Examination in Computers and Data Processing; c1968-present; Age: Adults; Educational Testing Service for the College Entrance Examination Board.

> A program designed for college accreditation of nontraditional study, advanced placement, or the assessment of educational achievement.

Computer Programmer Aptitude Battery by Jean Maier Palormo; c1964-67; Age: Adults; Science Research Associates, Inc.

> Designed for use with applicants for computer training or employment. Subscores are: verbal meaning, reasoning, letter series, number ability, and diagramming.

Diebold Personnel Tests; 1959; Age: Adults; John Diebold and Associates, Inc.

> Designed for use with computer programmers and systems analysts. Subtests include: Symbol Block Diagram, Code Index, Relations in Numbers, Code Matching, and Word Sequence.

IBM Aptitude Test for Programmer Personnel; c1964; Age: Adults; International Business Machines Corporation.

> Designed to assess applicants for programming training on IBM computers. Test is comprised of three subtests: letter series, figure series, and arithmetical reasoning. The test is restricted and permission to use it must be obtained from the IBM office in Trenton.

Programming Aptitude Test: Experimental Form S by Jack M. Wolfe; c1972; Grades: 13-16; Programming Specialists, Inc.

> Assesses aptitude for computer programming in terms of the ability to analyze a problem logically and the ability to perform detailed steps with a high degree of accuracy.

Punched Card Machine Operator Aptitude Test by Walter J. McNamara; c1953-55; Age: Adults; The Psychological Corporation.

> The test is used in the selection of candidates for IBM school. Subscores are: Arithmetic Reasoning and Abstract Reasoning.

Achievement Test for Data Processing Technology-Business by Thomas S. Baldwin; c1968; Grades: 13 and above; Thomas S. Baldwin (School of Education, University of North Carolina, Chapel Hill, North Carolina 27514).

> Covers: Data processing systems fundamentals, Programming language applications, COBOL, Statistics, Mathematics, Accounting-General, and Accounting-Cost.

Achievement Test for Data Processing Technology-Scientific by Thomas S. Baldwin; c1968; Grades: 13 and above; Thomas S. Baldwin.

> Covers: Data processing systems fundamentals, Programming language applications, FORTRAN, Statistics, Mathematics, and Accounting-General.

Revised Programmer Aptitude Test (International Business Machines) and Programming Aptitude Test (International Computers and Tabulators) are cited in: Walker, Elaine and Markham, S.J. "Computer Programming Aptitude Tests". Australian Psychologist, March 1970, Vol. 5, No. 1, 52-58.

Refer to: Korn, Willard M. "An Achievement Test for the Course: Introduction to Business Data Processing." Greeley, Colorado, Colorado State College, Spring 1968. Copies of forms A and B of an achievement test, and final forms A and B of the same test are provided in the body of the thesis. The microfilm is available for review in the ETS library.

TASK FORCE POSITION PAPER

DAY CARE

July 1, 1974

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TASK FORCE POSITION PAPER

DAY CARE

I. Delineation of the Field

A. Definition of the Field

The day care task force addressed itself, throughout both meetings, to the entire range of child development practices and occupations, expanding the concept of day care to all activities involving the mental, physical, and educational growth of children.

The task force members noted that the term "day care" traditionally implies little more than custodial care (food, shelter, and adult supervision). There are, in fact, a diversity of practices in the child care field which encompass not only direct custodial services but also comprehensive care programs including health care, social and creative practices, counseling, nutrition, etc. (see appendix B for task descriptions). These practices have evolved largely out of increasing public concerns over the quality of early child care services and have been developed largely on an individual basis at different facilities around the country.

It has been, therefore, difficult to define specific occupational skills in the day care field. Furthermore, day care skills do not necessarily correspond to any specific academic disciplines. Any one college may offer courses related to day care in three or four different departments: home economics, education, psychology, sociology, etc. Development of a procedure for translating day care occupations into academic achievement thus becomes quite difficult, for there is not one department that typically trains people in this

field (hence would be amenable to accepting credit for life experiences in the day care field).

As the task force expands the concept of day care to incorporate all occupational activities related to child development, some of the problems regarding comparable academic programming are reduced, for many colleges offer comprehensive child development programs. Nevertheless, the field remains quite diverse and ill-defined.

The task force drew on two projects that provide data with reference to delineation of the field: the Child Development Associate (CDA) project and the Kentucky-based V-TECS (Vocational Technical Educational Consortium of States) project in day care. The CDA project staff delineate the field on the basis of competency areas that are needed for effective performance as a mid-level functionary in a day care center (a person working at the "associate" level). In contrast to the normative approach taken by CDA, the Kentucky V-TECS project (as well as a similar project conducted in the state of Pennsylvania) takes a descriptive approach to delineating the field. The V-TECS project incorporates a task analysis, whereby people in the field are asked to indicate what particular tasks they perform on a daily basis and how much time they spend doing each task. From this analysis it is possible to determine what types of experience can be expected of workers in the field, given a specific day care setting and length of time working in the field.

In response to requests from members of the task force at the first meeting, questionnaires were drawn up to assess, in a preliminary manner, the extent to which specific tasks which are performed by workers in the child care field tend also to be topics of attention in

academic settings. A list of child development tasks were selected from among those identified in the V-TECS project. This list was sent to a small sample of colleges and universities that offer child development programs. Faculty at the institutions were asked to indicate the extent to which each task is contained in one or more courses offered.

Most of the questionnaires were returned, seemingly reflecting interest in, if not support for, the proposed assessment of child development competencies. The questionnaire results (see appendix A) indicate that there is considerable overlap between the tasks performed by people in the field and the curriculum offered in academic child development programs. Certain task areas that involve primarily custodial services or the care of infants (under three years of age) are not covered by most academic programs. Other task areas involving primarily managerial and legal aspects of running a day care center probably are covered in college courses other than those in child development areas. The data also indicate a fair amount of agreement among the colleges in terms of the tasks they do cover: some differences, of course, would be expected, given the fact that child development courses are offered in a variety of disciplines.

The questionnaire data tends to reflect favorably on child development as a field for further exploration in terms of assessment procedures leading toward academic crediting. Though academic child development programs do not lead directly toward work in the day care field (as, for example, courses in police science lead toward word in law enforcement), the data indicate considerable overlap, particularly in regard to theory and principles of child development. These areas

of overlap can serve as appropriate parameters of the child development field, especially if considered in relationship to the normative parameters set by the CDA project staff. This overlap can also be viewed in terms of the expressed opinion of the task force committee that there be a future outlook towards assessing both knowledge and performance and perhaps the development of integrated training and assessment programs.

B. Relationship to Other Disciplines

The field of child development tends to be interdisciplinary in nature, incorporating knowledge and skills training from a number of different academic and vocational domains. Members of the task force did not, however, address themselves in any depth to the issue of related disciplines, other than to note the prominent role played by management theory and practice in upper levels of day care work. If the proposed assessment procedure is to be applied to the upper-level areas of child development, then recognition must be given to the fact that disciplines other than child development will have to be involved.

C. Future Directions

Members of the task force were in general agreement that the field of child development is expanding rapidly, as a result of the increased number of mothers entering the work force, as a result of increased emphasis on early childhood education, and as a result of new modes of federal support (including income tax exemptions) for

day care facilities.

With this rapid expansion in day care, a challenge is posed to leaders in the field: how do we increase the number of qualified personnel, while also trying to improve the quality of services provided by existing facilities. The CDA project respresents an ambitious and significant attempt to meet this challenge.

In the future, task force members foresee greater emphasis on the educational and training components of child development, with relatively decreased emphasis being placed on traditional "day care" custodial services. The proposed assessment procedure must reflect this change in terms of the specific skills being tested. Furthermore, this change in emphasis will undoubtedly lead to a "professionalization" of the field and, concomitantly, to a demand for credentialing (AA or BA degree) and/or certification (through an apparatus such as CDA).

II. Assessment of Need for the Program

A. Institutional Need:

Members of the task force noted that numerous colleges and universities have eagerly sought out participation in the CDA indicating at least indirect support for the crediting arrangement being proposed. The CDA program, however, often leads to at least partial funding of ongoing or proposed child development projects, hence the institutional support for CDA must not be viewed with excessive optimism. Similarly, while state support of the Kentucky V-TECS project on day care curriculum indicates some institutional support

for the type of assessment procedure being proposed, it does not necessarily indicate support from the collegiate institutions, since money for the project comes from state and federal vocational education funds.

Members of the task force indicated, at the first meeting, a need for a least a sampling of collegiate institutions to see if there is much expressed support for the proposed assessment procedure. Questionnaires were sent out to colleges and universities that offer child development programs. The department chairperson from each of these programs was asked to indicate whether or not his or her department now provides academic credit for life experience and/or would be willing to grant credit for life experiences assessed by means of a nationally recognized procedure (see appendix A).

The results from the questionnaire indicate widespread support for the proposed assessment procedure, as well as only minimal use, at present, of comparable procedures at single institutions. These results would seem, in a very preliminary manner, to support the contention that an assessment procedure is needed in this field. Members of the task force, however, recommended a much more extensive feasibility study before any conclusions are reached.

B. Individual Needs

The V-TECS staff in Kentucky has collected data indicating that the mean educational level of day care workers is approximately at the 10th grade. This statistic would seem to indicate a need for college crediting arrangements for life experiences, especially if there is an increased demand for "professionalization" of the field.

If the CDA project is successful in promoting a national certification program for all mid-level day care personnel, then the demand for credentialing may be even greater, given the close linkage between the CDA project and collegiate training and educational programs in child development. On the other hand, if CDA initiates a considerable amount of training at collegiate institutions, (which at present must provide some academic credit to those individuals who successfully complete the training), then there may be no need for another crediting arrangement, since CDA participants will be receiving college credit for their participation in the training. The proposed assessment procedure, in this case, would only be needed: (a) for the "grandfather clause" personnel, who have the necessary skills as a result of considerable direct experience in the field, (b) as an interim crediting procedure (until the CDA program is instituted on a nation-wide basis), and/or (c) as a procedure to be used for the personnel who work at levels above or below the mid-level focus of the CDA project (though CDA is planning for future programmatic initiatives that will reach the upper and lower levels of child care personnel).

The potential role of the CDA project in regard to the proposed assessment procedure remains somewhat tentative since the orientation of CDA is toward the improvement of the quality of child care services rather than improvement of available educational opportunities for the people who deliver these services. This CDA emphasis on the child as the primary client and focus of personnel development is most appropriate; however, in regard to the proposed assess-

ment procedure, some rather complex and difficult questions are left unanswered with reference to the future role of CDA in providing procedures for academic crediting of occupational expertise in child development practices. One specific proposal offered by the task force members addresses this very issue: further resources (funding, personnel, time, etc.) should be made available to the CDA staff so that they might more thoroughly explore the implications of their project for the type of assessment procedure being considered by the day care task force.

III Currently Available Assessment Instruments

A. The CDA project clearly stands out as the source of extensive, field-tested assessment procedures in the area of child development practices (see appendix B for information on these procedures). While other assessment procedures have been developed, these procedures have either been incorporated into the CDA project, or have been reviewed and rejected by the CDA staff as inadequate.

While members of the task force were impressed with the scope and quality of the CDA materials, there was a commonly-expressed concern that alternative procedures be developed that would: (a) assess competencies at alternative levels (e.g. assess custodial competencies for lower-level workers or assess managerial competencies at higher levels) and/or (b) assess competencies in alternative ways (e.g. more open-ended assessments similar to University-Without Walls procedures, or more closed-ended assessments using the evaluation instruments to be developed out of the Kentucky V-TECS project.)

IV Areas of Assessment

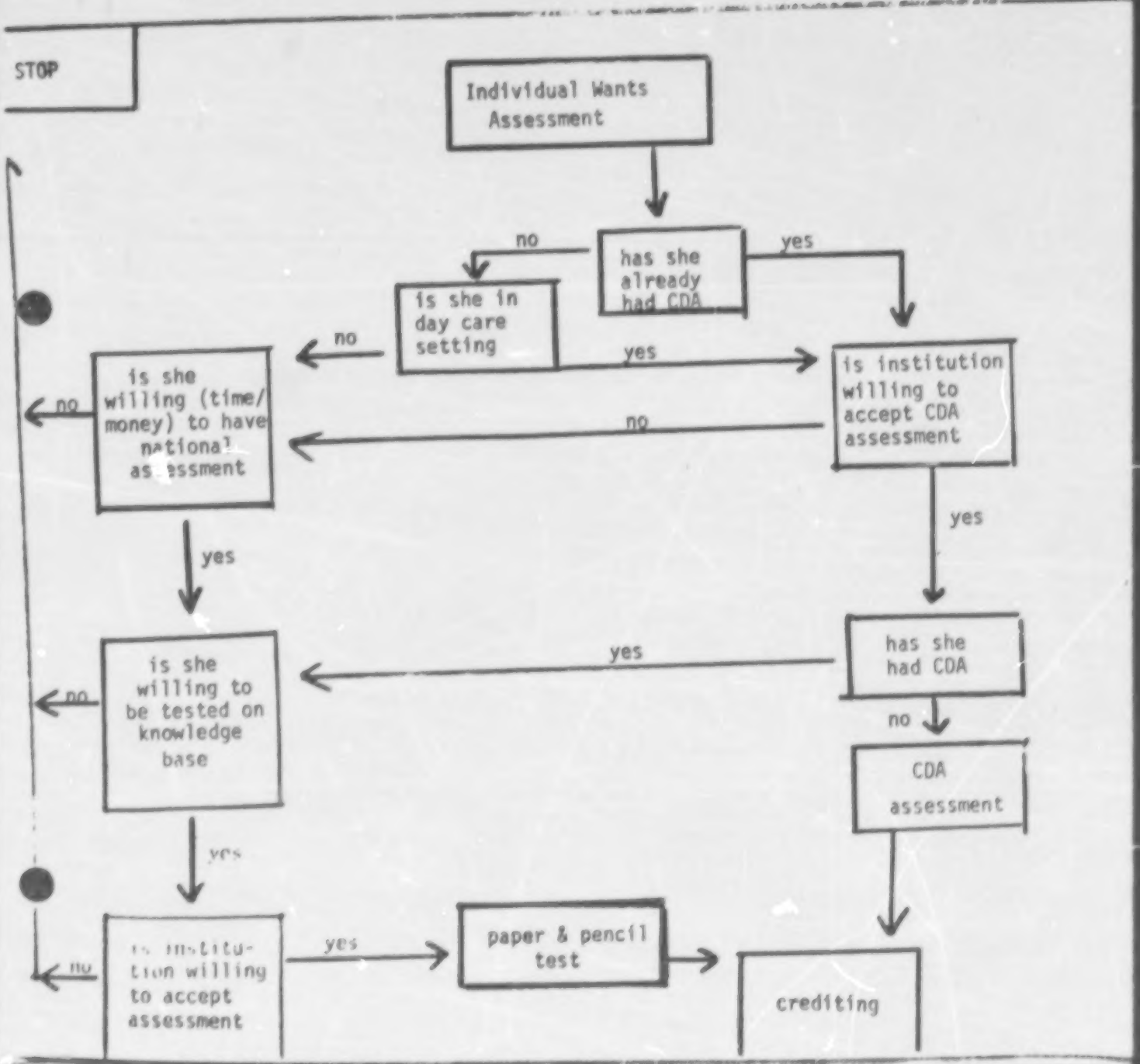
Competence in the field of child care was viewed by the task forceas consisting of three primary components: (1) performance (observable behavior), (2) conceptual mastery (illustrated knowledge) and (3) skills and attitudes (associated with desired roles). In the selection of appropriate assessment procedures, each of these three components should be kept in mind. Members of the task force proposed that at all levels of child development work, each of these three components be assessed, if college credit is to be granted. Furthermore, the task force members supported the CDA emphasis upon the inclusion of those people served by the child development worker in the assessment of the worker's competency. This emphasis on the role of the consumer in assessing competence was recognized by the task force members as a new orientation for collegiate institutions, hence as a potential source of conflict. However, task force members believed that colleges and universities, in all fields, will have to become increasingly responsive to pressures for public (and particularly consumer) input into both crediting and curriculum matters.

V. Recommendations Concerning Assessment Procedures

The task force made recommendations in regard to both: (a) the use of CDA assessment procedures, and (b) the development and use of alternative procedures. These twofold recommendations reflect the generally-held belief of the task force members that while the CDA assessment procedures will be extremely important in the future, they are probably not sufficient for the diversity of assessment procedures that may be requested by both institutions

and individuals.

In regard to the use of CDA assessment procedures, the following flow chart was offered as a tentative indication of the various decision points that might confront an individual who wishes to receive credit for past experiences in the field of child development practices:



The flow chart reflects three primary questions in the use of CDA assessment procedures: (a) is the student now working in a day care center? (if not, the CDA procedure as it currently operates would not be appropriate, without modifications, i.e. use of simulations or temporarily placing the student in a day care facility for purposes of testing her or him in a field setting); (b) can the student (or institution) afford (time and money) to go through the CDA procedure? (current cost estimates are $100 - $150, though this cost may go down with increased volume); (c) is the institution in which the student is enrolled (or wishes to be enrolled) willing to accept CDA assessment for credit? If the answer to any of these three questions is no, then alternative means will have to be developed. Given that a rather large number of potential assessees may not be able to meet all three conditions (at least until CDA is well established), alternative means will have to be developed, perhaps indicating a need for institutional change.

The task force was able to identify six alternative assessment models for the field of child development. Members of the task force recommended that each of these models be developed, and that individual institutions be given the opportunity to select the most appropriate one(s) from among the six.

Model One: Child Development Associate

Under this model, a student who wishes to receive credit for past experiences in the child care field can take assessments of her or his competency done at the day care center to any of a large number of colleges and universities (a multi-institutional model), in order to receive the credit. CDA will hopefully be accepted

by many institutions as both: (a) a valid assessment procedure, and (b) an acceptable source of training and continuing education in the field of child development. The CDA model is, of course designed for a single discipline (child development) and is performance based. While the categories under which the assessment is made are rather rigid (closed procedure), the specific information that goes into each category is subject to negotiation between the child care worker and the other members of the assessment team (open content).

Model Two: University Without Walls

The University Without Walls (UWW) provides a multi-disciplinary alternative to CDA. Unlike the CDA model, UWW is based in a single institution and tends to be open with respect to both procedure and content. While the UWW model does acknowledge the validity of performance-based criteria of assessment, it tends to be more amenable to other modes of assessment. UWW could be said to be contract-based (rather than performance-based). Each UWW student develops one or more learning contracts with his or her advisory committee. These learning contracts may take many different forms, and often cross over traditional disciplinary lines. Advanced placement represents the one part of the UWW program that most closely approximates the type of credit-for-experience procedure being considered in the current project. UWW students are required to bring in evidence (documentation) of past experiences that have been significant sources of learning, and to describe the nature of the learning that has taken place. A CDA

student might, for instance, use his or her certification as evidence for past learning, thereby receiving advanced placement in the UWW program.

In comparing the CDA and UWW models, CDA provides the advantage of offering a specific, discipline-oriented assessment procedure that will save time and money for the student who is primarily interested in receiving credit specifically for child development experiences. Furthermore, the UWW program is now, and probably will remain, available at only a small number of institutions. UWW, on the other hand, may be more appropriate than CDA for the student who wishes to receive credit for a variety of past experiences (including child development) and/or who has experience in the child development field at a level which is not currently covered by the CDA program (e.g. day care center management).

Model Three: CLEP

A knowledge-based (rather than competency or contract-based) assessment procedure may be of particular value to students who wish a low-cost, single-discipline test in the child development field. Results from such a test would probably be acceptable at a number of colleges and universities (multi-institutional), and could be developed on the basis of a number of advanced placement tests that apparently are already available in various collegiate institutions throughout the country. This model is based on the assumption that a specific set of questions (closed procedure, closed content) can be asked to assess the validity of past learning experiences in the child development field.

Model Four: V-TECS

Under this model, a student who wishes to receive academic credit for past experience in the child development field would have to be able to document this experience on the basis of a detailed job inventory (describing the specific tasks performed over the past five to ten years) that is validated by the supervisor at the day care center(s) in which she or he has worked. The job inventory would be compared with the detailed task analyses that have been developed by V-TECS for curricular development and evaluation. High levels of overlap between the job inventory and curricular task analysis would indicate that the student should receive credit for past experiences in the child development field. This single-discipline approach is performance-based and closed with respect to both procedure and content. Such an assessment procedure would be accepted by several institutions (multi-institutional), probably on a state-wide basis.

Model Five: Transfer

This model addresses the issue of crediting past learning experiences in the child development field that are formal, i.e. involve institutional, structured training in the field. Child care workers often receive rather extensive training outside the formal academic setting. Teachers in the Montessori Schools, for instance, receive extensive training and theory input, as well as an apprenticeship. The transfer model would provide a vehicle for the formal transfer of credit from this learning program to the collegiate institution.

An appropriate transfer model can be found in the police science field, wherein police officers who have completed Police Academy training in the state of California, automatically receive a certain number of credits in a comparable program at their local community college. A similar procedure could be established in the child development field, wherein certain recognized training programs are formally recognized as equivalent to academic courses, hence training in these programs can be transferred as college credit in child development disciplines. This model will probably have to be adopted by single institutions, within single disciplines. It is a closed procedure, closed content model, in that the external training program would have to be rather consistent and uniform if credit is to be granted. It can be either knowledge or performance-based depending on the evaluation procedures used by the training institute.

Model Six: Exchange

In the case of workers at the higher levels of the child development field, the most important type of crediting arrangement that is needed involves previous academic experience rather than on-the-job or training experiences. The manager of a day care facility may wish to receive further education in a specialized field that is not offered at the local community college or university. As a result the student may have to go to another college or university, sometimes in another state. Under these conditions the student will have to pay out-of-state tuition and often cannot have the credits earned at this other institution

transferred to the local institution from which he or she may be receiving some other type of training.

In the area of child development (as well as other areas related to home economics) an exchange program has been developed by the Western Home Economics Research Advisory Council, in cooperation with WICHE, whereby a student can receive an advanced degree through one institution (e.g. Colorado State University) while taking at least part of the degree work through another institution (e.g. Oregon State University). This model is multi-institutional, single discipline and primarily knowledge-based. It is based on open procedures, and open content.

Members of the task force thought that each of these models are appropriate in certain settings and with different occupational levels in the child development field. This multi-model approach to assessing child care competencies would include all levels of child development. The following table illustrates this point:

Role in Day Care Facility	Academic Degree Program	Assessment Model
Director	Ph.D.	#6
	M.A.	#5
		#2
Teacher	B.A.	#1
	A.A.	#3
Aide	GED	#4

The task force recommended that these six models be fully developed and described in a publication on alternative approaches to crediting occupational experiences in the field of child development practices. This publication would be made available at low cost to people in the field (academic and nonacademic) throughout the country. Several members of the task force indicated interest in working on this project. The publication would include not only descriptions of the alternative models, but also identification and, if possible, publication of existing materials (tests, job inventories, documentation procedures, etc.).

APPENDIX A

Questionnaire Results

The attached questionnaire was sent to a small sampling of colleges with programs related to child care and development within the 13 western states serviced by WICHE. The questionnaire reflects the tentative nature of the task force in process and was intended to serve as a tool for suggesting possible directions for the task force committee.

The first part of the questionnaire is intended to indicate the extent to which the responding institution currently is involved, or is willing to become involved, in credit-for-experience programs. The rest of the questionnaire is designed to ascertain the extent to which specific tasks performed by day care personnel are related to the instructional goals and content of institutional curricula.

Of the eight institutions that returned the questionnaires, two opted not to record their names. The six institutions that did record their names are as follows:

Brigham Young University
Carroll College
Community College of Denver
Mills College Children's School
Montana State University
University of Arizona

Request for Information

(1) The academic (professional) responsibilities of most respondents were related to administration. Two of the five administrators noted instructional duties and one listed some involvement with a training program. Moreover, one respondent is director for a pilot project to develop a competency-based training and assessment program in child development. The project is one of thirteen funded by the National Office of Child Development

(2) Below is the distribution of responses given to each section of this item. A summary of the answers given to the remaining discussion questions will follow.

If a nationally-recognized procedure was developed by a reputable testing firm for assessing competencies in the day care field, do you think that your institution would be willing to grant academic credit for demonstrated competencies, if these competencies were related to course work:

a. 2 Yes, my institution/department already has established procedures for crediting occupational competencies (please include documents describing this procedure at your institution, if available.)

APPENDIX A (Contd.)

b. 2 Yes, I firmly believe that my institution would accept credit, up to a maximum of approximately _____ semester/ quarter hours. (see discussion summary)

c. 4 Yes, provided that the following conditions were met:

d. 1 Probably not, for the following reasons: (see discussion summary)

(3) Four of the eight respondents indicated that they had some knowledge of currently existing programs or procedures for assessing and credentialing experience-based competencies in the field of day care. Three of the eight did not respond to this question, and one reply was negative.

The CDA Consortium was the organization most commonly known to the respondents. However, only one respondent knew of three resources. This respondent is the project director for a pilot project funded by the National Office of Child Development. The list of organizations is as follows:

Dr. C. Ray Williams, Executive Director
Child Development Associate Consortium
7315 Wisconsin Avenue, N.W. Suite 601E
Washington, DC 20014

Dr. Jenny Klein
Director of Educational Services
Office of Child Development
Department of Health, Education, and Welfare
Washington, DC 20013

CDA Pilot Project
Community College of Denver
1001 East 62nd Avenue
Denver, CO 80216

Summary - Discussion Answers

2(b) Only one respondent answered with any certainty in regards to the number of credit hours that his or her institution would accept for experience-based competencies. This individual stated a maximum of six semester hours. Another respondent replied by stating that there was presently no way of determining the approximate amount of credit hours that would be acceptable to his or her institution.

2(c) Responses to this question indicated a concern for departmental control and autonomy in the assessment of occupational competencies for academic credit. Three of four respondents stipulated that the procedures be subject to review and approval by a formal administrative body within the institution. For example, one re-

APPENDIX A

Summary - Discussion Answers

2(c) (continued)

spondent indicated that such procedures would have to be sanctioned by the Board of Studies of the College: another stipulated the approval of the University and the Board of Regents.

The fourth respondent stated three conditions that would have to be met before assessment procedures are accepted by his institution: (1) the experience must be supervised by qualified instructors, (2) the experience must be verifiable in writing, and (3) the applicant must have 40 hours of experiential learning in a day care facility.

2(d) Only one respondent stated that his or her institution would not accept credit for occupational competencies. This person doubted whether the performance of day care occupations and skills reflect college level ability and suggested that high school might be an appropriate level to demonstrate this kind of learning.

Course Content Survey

The respondents reported a variety of courses being taught in their institutions. The courses are generally related to the areas of child growth, development, and health, and include such disciplines as education, psychology, and home economics. The majority of the courses mentioned pertain to some aspect of child development or early childhood. Some of the specific courses are as follows: Problems in Early Childhood Education, Introduction to Early Childhood, Nursery School Education, Child Adolescent Psychology, Methods for Teaching Young Children. Other courses mentioned were: Family Relations, Parent Education, Theory and Practice of Nursery Schools, and Management of Child Care Centers.

The job inventory of day care activities has been broken down into broad categories. Under each category are a number of items that indicate specific job related tasks that are performed by day care personnel. The respondents have been asked to rate these items according to the extent to which each of them are related to the instructional content and goals of the courses offered in their institutions. The total responses for each item were recorded as an arithmetic mean and then ranked appropriately within each of the broad categories.

APPENDIX A

COURSE CONTENT SURVEY (contd.)

SCALE: 0 = irrelevant 1 = a few will learn 2 = many will learn 3 = most will learn 4 = essential

Task Inventory	Responses	Arithmetic Mean	Ranking
A. PLANNING ACTIVITIES OR PROGRAMS			
1. Plan art activities	4/4/4/3/4/4/4/4/	3.9	2
2. Plan daily schedule of activities	4/4/4/4/4/4/4/4/	4.0	1
3. Plan dramatic play	4/4/3/3/4/4/4/4/	3.8	3
4. Plan free play	4/4/3/3/4/4/4/4/	3.8	3
5. Plan manipulative play such as puzzles and woodblocks	4/4/4/3/4/4/4/3/	3.8	3
6. Plan monthly program	4/4/4/0/1/4/3/4/	3.0	5
7. Plan music	4/4/4/3/4/4/4/4/	3.9	2
8. Plan nature science activities	4/4/4/3/4/4/4/4/	3.9	2
9. Plan outdoor play	4/4/4/3/4/4/4/4/	3.9	2
10. Plan special activities such as field trips, resource persons, holiday celebrations and parties	4/4/3/3/3/4/4/3/	3.6	4
11. Plan weekly programs	4/4/4/4/4/4/4/4/	4.0	1
B. PREPARING PROGRAM MATERIALS			
1. Arrange equipment for activities such as art, music, and stories	4/4/4/4/4/3/4/4/	3.9	1
2. Assemble materials for activities such as art, music, and stories	4/4/4/4/4/3/4/4/	3.9	1
3. Coordinate materials such as records and books with program theme	4/0/3/3/4/3/4/3/	3.0	3

APPENDIX A

COURSE CONTENT SURVEY (contd.)

Task Inventory	Responses	Arithmetic Mean	Ranking
B. PREPARING PROGRAMS MATERIALS (contd.)			
4. Decorate center for seasons, holidays, and themes	4/0/3/0/4/3/4/3/	2.6	4
5. Prepare materials such as play dough, finger puppets, and flannel boards	4/4/4/3/4/4/4/2/	3.6	2
6. Select television programs	3/0/2/0/0/0/3/1/	1.1	5
C. GUIDING PROGRAM ACTIVITIES			
1. Arrange displays of children's work	4/4/2/3/4/4/4/2/	3.4	4
2. Guide art activities	4/4/4/3/4/4/4/4/	3.9	1
3. Guide children in putting away toys and equipment	4/4/3/3/4/4/4/4/	3.8	2
4. Guide dramatic play activities	4/4/3/3/4/4/4/4/	3.8	2
5. Guide food preparation activities	3/ /2/3/4/4/4/3/	3.2	5
6. Guide free play activities	4/4/4/3/4/4/4/4/	3.9	1
7. Guide manipulative play such as puzzles and woodblocks	4/4/3/3/4/4/4/3/	3.6	3
8. Guide music activities	4/4/4/3/4/4/4/4/	3.8	1
9. Guide nature science activities	4/4/4/3/4/4/4/4/	3.9	1
10. Guide outdoor play	4/4/3/3/4/4/4/4/	3.8	2
11. Provide individual attention for children	4/4/4/3/4/3/4/4/	3.9	1
12. Supervise special activities such as parties and field trips	4/4/3/3/4/4/4/4/	3.9	1

APPENDIX A

COURSE CONTENT SURVEY (contd.)

Task Inventory	Responses	Arithmetic Mean	Ranking
C. GUIDING PROGRAM ACTIVITIES (contd.)			
13. Supervise story time	4/4/4/3/4/4/4/4/	3.9	1
14. Supervise television viewing	3/ /2/0/0/0/3/0/	1.1	6
D. GUIDING DAILY ROUTINES			
1. Administer first aid	3/ /1/3/1/3/4/3/	2.5	8
2. Administer prescribed medication	3/ /1/0/1/4/1/0/	1.4	9
3. Carry out emergency measures in events such as severe illness, accident, or fire	3/4/2/3/1/4/4/4/	3.1	6
4. Conduct daily health observation	3/4/2/3/4/4/4/0/	3.0	7
5. Greet children upon arrival	4/4/4/4/4/4/4/4/	4.0	1
6. Guide snack or meal activities	4/ /1/3/4/4/4/4/	3.4	5
7. Help children with clothing	4/4/3/3/4/4/4/4/	3.8	3
8. Prepare children to go home	4/4/4/3/4/4/4/4/	3.9	2
9. Report signs of illness or discomfort in children	4/4/3/3/4/4/4/3/	3.6	4
10. Supervise homework of "after school children"	3/0/1/0/0/0/0/0/	.5	10
11. Supervise rest periods	4/4/3/4/ /4/3/0/	2.5	8
12. Supervise routine bathroom procedures	4/4/3/3/4/4/4/4/	3.8	3
E. CARING FOR INFANTS			
1. Bathe infants	0/0/1/0/0/0/0/0/	.1	2
2. Change diapers	0/0/1/0/0/0/0/0/	.1	2

APPENDIX A

COURSE CONTENT SURVEY (contd.)

Task Inventory	Responses	Arithmetic Mean	Ranking
E. CARING FOR INFANTS (contd.)			
3. Check crying infants	0/0/1/0/0/0/0/0/	.1	2
4. Dress infants	0/0/1/0/0/0/0/0/	.1	2
5. Feed infants	0/0/1/0/0/0/0/0/	.1	2
6. Follow parents' instructions	0/0/1/0/0/0/0/0/	.1	2
7. Hold infants	0/0/1/0/4/0/0/0/	.6	1
8. Plan infant stimulation activities	0/0/1/0/4/0/0/0/	.6	1
9. Play with infants	0/0/1/0/4/0/0/0/	.6	1
10. Prepare food for infants	0/0/1/0/0/0/0/0/	.1	2
11. Prepare materials for infant stimulation	0/0/1/0/4/0/0/0/	.6	1
12. Supervise rest and sleep	0/0/1/0/0/0/0/0/	.1	2
F. PREPARING AND SERVING FOOD			
1. Plan meals and snacks	0/2/0/4/4/ /4/3/	2.4	1
2. Prepare meals and snacks	0/2/0/4/1/ /4/4/	2.1	2
G. GENERAL HOUSEKEEPING			
1. Arrange play areas	4/4/3/3/4/4/4/2/	3.5	2
2. Care for pets and plants	4/4/3/3/4/4/4/2/	3.5	2
3. Check toys for safety and repairs	4/4/3/3/3/4/4/1/	3.2	3
4. Make minor repairs to equipment and furniture	4/4/3/3/2/3/4/1/	3.0	4
5. Store equipment and materials	4/4/3/3/4/4/4/3/	3.6	1

APPENDIX A

COURSE CONTENT SURVEY (contd.)

Task Inventory	Responses	Arithmetic Mean	Ranking
H. CONTACTING PARENTS			
1. Attend parent meetings	4/0/4/0/4/4/4/	2.9	5
2. Contact parents in case of emergency or illness	4/4/2/4/2/3/4/3/	3.3	4
3. Discuss with parents sources of special help	4/ /2/3/4/4/3/3/	3.3	3
4. Inform parents of changes in behavior	4/4/2/3/3/3/4/4/	3.4	2
5. Inform parents of rules and routines of the center	4/4/2/3/3/3/4/4/	3.4	2
6. Interpret the child to other staff members	3/4/3/3/4/4/2/4/	3.4	2
7. Contact parents by such methods as writing, informal conversation, and planned conferences	3/4/4/3/4/4/4/4/	3.8	1
I. CLERICAL WORK			
1. Greet guests	4/ /3/0/0/4/3/0/	2.0	2
2. Keep activity records of "after school children"	3/ /1/0/0/0/0/0/	.6	4
3. Keep records such as attendance, health, development, and transportation	3/ /4/0/4/4/0/4/	2.7	1
4. Prepare reports	3/ /4/0/4/0/0/0/	1.6	3
J. ADMINISTERING THE DAY CARE CENTER			
1. Conduct parent meetings	3/ /2/0/0/4/4/4/	2.4	5
2. Conduct public relations programs such as advertising and open house	3/ /2/0/0/3/3/2/	1.9	9

APPENDIX A

COURSE CONTENT SURVEY (contd.)

Task Inventory	Responses	Arithmetic Mean	Ranking
J. ADMINISTERING THE DAY CARE CENTER (contd.)			
3. Conduct staff meetings	3/ /1/0/4/3/3/4/	2.6	4
4. Establish personnel policies	3/ /1/0/4/4/0/4/	2.3	6
5. Establish policies such as fees and hours	3/ /0/0/0/4/0/4/	1.6	11
6. Hire and dismiss employees	3/ /0/0/0/4/0/4/	1.6	11
7. Inventory equipment and supplies	3/ /1/0/4/4/4/4/	2.9	2
8. Keep insurance programs current	3/ /0/0/0/4/0/4/	1.6	11
9. Keep license current	3/ /0/0/0/4/4/4/	2.1	7
10. Plan parent meetings	3/ /2/0/0/4/4/4/	2.4	5
11. Plan staff meetings	3/ /1/0/4/3/4/4/	2.7	3
12. Plan staff work schedule	3/ /1/0/4/0/4/4/	2.3	6
13. Plan transportation for children	3/ /2/0/0/0/0/2/	1.0	12
14. Prepare budget	3/ /2/0/0/4/0/4/	1.9	9
15. Purchase equipment and supplies	3/ /3/0/0/4/0/4/	2.0	8
16. Request needed equipment and supplies	3/ /3/0/4/4/4/4/	3.1	1
17. Supervise workers	3/ /2/0/0/4/4/4/	2.4	5
18. Train workers	3/ /2/0/0/1/2/4/	1.7	10

Planning the Development of Measurement and Evaluation Services for Use in Occupational Programs at Postsecondary Institutions

Position Report

of the

TASK FORCE ON ELECTRICAL/ELECTRONICS TECHNOLOGY

to the

ADVISORY COMMITTEE

EDUCATIONAL TESTING SERVICE
Princeton, New Jersey 08540

May 1974

Introduction

The Educational Testing Service, the College Entrance Examination Board and the Western Interstate Commission on Higher Education have jointly undertaken a project to explore the needs of postsecondary institutions for occupational competency measures. An Advisory Committee, which is providing overall guidance to the Project's staff, has recommended that the focus be on the need for instruments and procedures to translate work experience to degree or certificate credit in eight prototype occupations. A task force of experts representing different points of view has been assembled in each occupation, including the field of electronics technology.

This position report is based on meetings held by the members and staff of the electrical/electronics task force on February 28-March 1 and April 11-12, 1974 in Princeton, New Jersey. Parts of this paper are based on studies and other source data gathered by the members of the task force and the staff, while other parts are based on the opinions and recommendations of the task force members.

The task force members were:

Joseph B. Aidala
Queensborough Community College

Ralph M. Caldwell
State Education Department, Mississippi

Dennis L. M. Irion
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Merton Jacobs
General Motors Institute

William M. O'Hara
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Other Participants:

Joseph M. Snarponis
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Educational Testing Service

The Field of Electrical/Electronics Technology

Electrical/electronics technology is basically one of the engineering technologies. According to the Engineers' Council for Professional Development (ECPD), the organization responsible for accrediting engineering technology programs,

> "Engineering technology is that part of the technological field which requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsman and the engineer at the end of the spectrum closest to the engineer."

The job of the engineering technician is more limited than that of the engineer and has a greater practical orientation. While technicians usually work in support and under the direction of engineers, they may sometimes

accomplish tasks that might otherwise be done by engineers, such as writing technical manuals, serving as sales or field representatives and providing advice on installation and maintenance.

The field of electrical/electronic engineering technology includes various kinds of communication equipment such as radio, television, radar sonar and telephone; electrical machinery such as motors, generators and devices; data processing equipment such as electronic computers; navigation equipment and many other kinds of equipment using transistors, semiconductors, vacuum tubes and printed circuits. The technician working in the field must be able to read and understand wiring diagrams and schematics of various complexities, modify and install electrical/electronic equipment; apply mathematical and scientific principles to electrical/electronic problems; diagnose and correct malfunctioning of electrical/electronic machinery, equipment and control (i.e. trouble-shoot); set up and/or conduct performance tests on electrical components, on units and/or systems; and compile test results and prepare technical drawings, charts, graphs and reports.

Occupational Outlook and Mobility

The employment opportunities for electrical/electronic technicians are likely to be good through the next decade.

The growth in employment will come about by the increasing sophistication of modern equipment and processes which will require a growing number of technicians to assist engineers in the construction, installation, operation, and maintenance of complex equipment.

Although in some situations technicians and technologists compete for jobs with engineers, more often they will be members of a team with the engineer. The engineer's strong background in mathematics and science gives him a leading position in solving complex technical problems and in participating in management where complicated technical operations are involved. The technician is not likely to become an engineer, but in a limited number of situations he may supervise engineers because of his superior management skills.

There is no information on the number of technicians who leave the field and enter an unrelated occupation. It appears, however, that many technicians transfer across fields of engineering technology; e.g. from mechanical to electrical technology.

Education of Engineering Technicians

The most comprehensive recent study on the education of engineering technicians has been conducted by the American Society for Engineering Education (ASEE, 1972). The study reveals that only about half of the currently-employed technicians have formal education beyond high school and those with postsecondary education have, as often as not, an education closely related to their employment as technicians.

Basically two kinds of degrees are offered in electrical/electronics engineering technology by institutions of higher education. The associate degree is by far the most prevalent, being offered in 550 curricula at 300 institutions. Approximately 6,000 associate degrees in the field have been awarded in 1969-70. The largest enrollment of technicians at the Associate level is in the comprehensive community colleges; the rest are enrolled in technical institutes, 4 year colleges and degree-granting corporate schools. During the past decade there was a significant rise in the number of major corporations such as RCA, General Motors, and Control Data, which provide technical education to large numbers of students. About 65,000 students were enrolled in such schools in 1970.

The second kind of degree which is being offered is the Bachelor of Technology. The number of institutions offering this kind of degree is only a fraction of those offering

associate degrees (1000 graduates with the electrical/electronics bachelor degree, or 1/6 of the graduates with associate degrees), yet there is a definite trend by many universities to offer it. The baccalaureate degree student receives a greater depth and breadth of education in his technical specialty as well as in liberal arts studies. Upon entering industry, he is able to act independently and will often be placed in a position of supervising technicians and draftsmen. He engages in many of the same activities as the engineer, but usually at a later stage in the progression from concept to product. The term "engineering technologist" is generally applied to graduates of baccalaureate programs and the term "engineering technician" to graduates of associate programs. Neither the technologist nor the technician generally work in the capacity of an engineer but both provide technical support to the engineer.

A recent innovation in the baccalaureate technology programs is known as the "two-plus-two" sequence. Approximately 30 percent of the graduates of 2 year tachnician programs transfer into Bachelor of Technology curricula and obtain their Bachelor degree within 2 years. Although some academic time may be lost in the transfer, the "two-plus-two" is rapidly becoming one of the major educational patterns in engineering technology.

Although the Advisory Committee's charge to the task force was to explore the needs and approaches to assessment of occupational competency in the field of electronics technology, the task force decided to broaden the definition of the field to include electrical technology. Since college curricula for the two kinds of technologies are almost identical, it is logical to assume that the fields have similar educational and training requirements and similar needs for standardized measurement and evaluation instruments. Specialization in one of the many cluster of occupations in the fields generally does not occur until the technician enters industry. Although the curricula of community colleges are influenced by local industry, the common training requirements in the two fields do not provide the student sufficient time to specialize in college. Thus, this report will apply to the field of electrical/electronics technology.

Needs of Postsecondary Institutions for Assessment Measures

There are no data bearing directly on the question as to whether postsecondary institutions need assessment measures in electrical/electronics technology. Much of the data, however, indirectly relates to this issue and suggests that the need exists.

The usefulness of any standardized instrument will, to a

large extent, be determined by its correspondence to the curriculum. Any tests which are to be employed for the purpose of granting credit or advanced placement for appropriate work experience must provide adequate coverage of the content of the courses in the curriculum so that the equivalency between a test and course objectives can be established. A standardized instrument that is to assess equivalencies or outcomes of technical courses in a large number of institutions would be useful only if the curricula of those institutions were similar. Without comparable curricula it would be difficult, if not impossible, to develop instruments which combine the common elements in the curricula. The available evidence suggests that the content and structure of most of the electrical/electronics technology curricula of colleges and universities are quite similar. A survey of 208 schools (Foley, 1967) found that about two-thirds of them follow the Office of Education guidelines (Bulletin OE-8009) as their principal guide for developing their instructional content. About 15 percent utilize local staff for this task and about 5 percent employ state-developed guides.

The ASEE Study of 120 associate degree engineering technology curricula found that the curriculum structures of the various programs are similar in detail as well as in general distributions of credit requirement into the categories of technical, basic science and non-technical areas.

The absolute amount of credit that can be granted is higher in the baccalaureate technology programs because they offer a greater number of courses and credits in the candidate's technical specialty than the associate technology programs. In either kind of program, however, it is unlikely that the candidate would receive credit for all the technical specialty courses even if his level of proficiency merited such action. Technology departments are likely to require that their students take a minimum number of technical courses within their department in order to meet their degree requirements.

One of the more cogent arguments for the granting of degree credit for proficiency gained outside the formal classroom in these days of declining higher education enrollments is that the occupationally competent candidate expects to receive credit and unless it is offered, he may not enroll. The growth of credit-by-examination programs such as CLEP has changed the climate of higher education in such a manner that there are very few colleges today which do not attempt formally to recognize nontraditional or experiental learning.

The decision as to whether and how to grant credit is generally made by the individual departments. There is good reason to believe that many departments of electrical/electronic technology are currently granting credit for work experience. The procedures used, however, are not objective

The typical curriculum contains a total of 72 semester credit hours, of which 40 hours are devoted to technical courses (technical specialty, related technical specialties and technical sciences) and the rest to mathematics, science, communications and humanities/social studies. The typical accredited baccalaureate engineering technology program has a total of 130 semester hours of which 60 are in the technical sciences, technical specialty and related technical specialties, while the rest are in general studies, mathematics, basic science, specified non-technical courses and technical electives.

One factor which tends to standardize the curricula is the formal accreditation which is conducted by the ECPD. Although the ECPD does not dictate the content of the curriculum to the college, it does set minimum standards for basic curriculum components, faculty qualification, and facilities. The ECPD evaluates and accredits both associate and baccalaureate technology programs.

The focus of any assessment program for the purpose of granting credit should be primarily on the technical specialty portion of the curriculum, i.e. the specific subject matter of electrical/electronic technology and to a lesser extent on the technical sciences and related technical specialties. Standardized assessment tests in the basic sciences, mathematics, and liberal arts areas are already available in the form of the CLEP Examinations.

or uniform. The candidate may be interviewed by the department chairman or another faculty member, he may be asked to take a locally developed equivalency examination, or he may take the final examination which is used in the course in which credit is desired. A single instrument for granting college credit would probably not be acceptable if it does not cover most of the content of a particular course in the curriculum. Some departments may want to use standardized examinations as initial screening devices and personal interviews and tailor-made examinations to make the final decision.

Individual Needs

The Bureau of Labor Statistics estimates that only about one out of four engineering technicians has two or more years of postsecondary education in his field of work. This finding suggests that a potential pool of about 150,000 electrical/electronics technicians would constitute the basic target population for any assessment instruments and procedures. Obviously, it cannot be assumed that all or even most of these technicians desire to pursue higher education. Nevertheless, there are strong pressures on non-degreed technicians to continue their formal studies. Opportunities for employment, salary raises, and promotions are greater for graduates than for the non-graduates. Many companies which hire technicians have tuition refund programs for the reimbursement of their employees' tuition for courses taken at local colleges.

A relatively small percentage of technicians, however, appears to be taking advantage of these programs, possibly because reimbursement usually applies only to courses related directly to the worker's occupation.

In addition to industry, there are other settings in which a significant number of electrical/electronics technicians are being trained outside of the mainstream of formal higher education. The Armed Services is one source of such training. It is estimated that the Air Force alone has some 110,000 technicians who have been trained in electronics. Other significant sources of training in the field are the corporate schools, private technical institutes, and correspondence schools.

Some technicians, who have experience and competency in the field of electrical/electronics technology and desire to enroll into an Associate or a Bachelor of Technology Program, would receive some credit and advanced placement whether or not standardized instruments were available for such a purpose. On the other hand, technicians who would not otherwise think of higher education would be encouraged to enroll in degree programs just by the mere knowledge that such instruments are available.

In conclusion, the need for measures from the technician's viewpoint to translate work experience into college credit is

urgent. There is likely to be a strong demand for degreed technicians within the next decade. Since only one-fourth of all currently practicing technicians have degrees and since off-campus learning in the field is growing, there is a need for better articulation between formal and nonformal education.

Other Assessment Needs

Although the major focus of this position paper is on the analysis of need for developing occupational competency tests for granting college placement or credit, other assessment needs are apparent in the field of electrical/electronics technology.

Keeping current in any rapidly changing field is a difficult task for the practitioner and this is especially true in electrical/electronics. Many technicians who have been on the job for several years do not have the opportunity or are not motivated to keep their knowledge current. Since the skills of many of these individuals will become obsolete, it is useful to explore the ways by which technicians might be encouraged to pursue continuing education opportunities (the problems with the tuition-refund programs have already been discussed). A self-assessment for the continuing education of technicians could be one way to upgrade the field by encouraging self-improvement of the worker. One model for

such a program would be for the technician to take an examination on a periodic basis. The scores on the examinations would remain confidential--only the examinee would be given the results. Once the examinee has identified his weak skills, he would be guided to text books, courses and other continuing education resources.

Employers who hire technicians want to maximize the probability that the employee will remain and succeed on the job. Job-related measures based on job analysis will aid the employer in choosing those applicants who are best qualified for the job. Since the work of the electrical/electronics technician varies by industry and by company, it is questionable whether a single test instrument would be relevant for all or even most employment situations. Furthermore, the technician's competency is not fully developed at the time of his employment. The college will generally give the student a broad background in the field while industry will provide him with additional training in a particular specialty. Thus, standardized selection tests are likely to have utility only as one part of the candidate's assessment which would include non-test measures to evaluate his training and experience.

Available Competency Tests

Although there are many tailor-made examinations in electrical/electronics technology used locally at junior

colleges and industrial settings, the focus here will be on standardized proficiency or competency examinations which are administered on a wide basis. These examinations will be evaluated primarily in terms of their appropriateness for assessing experiential learning and translating it into college credit rather than their psychometric properties.

1. National Occupational Competency Tests. There are three tests in the field which are administered by the National Occupational Competency Testing Institute (NOCTI). These are Industrial Electronics, Industrial Electrician, and Electronics Communication. The major purpose of the examinations is to admit and to provide advanced placement and credit to experienced technicians who desire to enroll in teacher-training institutions and become vocational teachers. All three tests have written and performance parts and take approximately 7 hours to complete. Although the examinations appear to be current and fairly comprehensive, their breadth is a disadvantage for granting credit for a specific course. The tests appear to be better suited for the purpose for which they were intended - to assess competency of the prospective vocational education teacher - because such teachers are expected to have a mastery or journeyman's level of competency.

2. ICET Test in Electrical/Electronics Engineering Technology. The Institute for the Certification of Engineering Technicians (ICET) is an examining body which determines the competency of engineering technicians in various fields who voluntarily apply for certification. There is a written certification examination in electrical/electronics technology which has two parts. The first part contains sections on communications skills, mathematics and physical science. The second part is divided into two sections: the first contains 25 questions on basic technical concepts in the field, and the second contains 100 questions, of which the examinee selects 20 - allowing him to demonstrate his knowledge in his particular specialty. Since the ICET examination has been developed on the basis of job analysis and job description of technicians in industry, it may not be appropriate to the college curriculum. It is too broad to establish equivalency between learning experiences and specific courses in the curriculum.

3. Troubleshooting Trainer-Tester Devices.* These are paper-and-pencil troubleshooting problems in a large number of electrical and electronic equipment such as servo, radar, television receiver, transmitters, etc.

*Published by Van Valkenburg, Nooger and Neville, Inc.

A problem sheet describes the problem with a unit. The examinee obtains test instrument readings at test points of his choice by erasing an ink overprint in a "symptom" area on the sheet. After isolating the fault, the examinee indicates a part replacement or adjustment by an erasure in the "remedy" area. Schematic and wiring diagrams, and equipment photographs are supplied on auxiliary sheets. The trainer-tester can provide a realistic assessment in troubleshooting logic even though it is in a paper-and-pencil format. Because the trainer-testers are limited to troubleshooting, they are only partially appropriate for college curricula which focus primarily on teaching theory and its application.

Subject Matter of the Field

Although the field of electrical/electronic technology is extremely broad, most departments have a similar set of technical courses as part of their curriculum. These courses invariably consist of both class and laboratory activities, but the emphasis is on the teaching of theory and knowledge rather than the specific application of the knowledge. The courses may vary in their titles but most of them are probably equivalent to one of the major areas of the field listed below:

I. Basic Electronics
   A. Vacuum tubes
   B. Semiconductors
   C. Solid state devices
II. AC and DC Circuits
   A. AC Circuits
   B. DC Circuits
III. Electrical Machinery
IV. Digital Principles and Techniques
V. Basic Feedback Control Systems
   A. Positive and negative feedback
   B. Analog computation and simulation
   C. Block diagrams (1st and 2nd order systems)
   D. Transfer functions and Laplace transforms
   E. Frequency Response (Bode plots) analysis
   F. Proportional derivative and tachometric control
   G. Stability
   H. Servo components
VI. Communications Electronics
VII. Measurement and Instrumentation
   A. Test equipment and measurement
   B. Process Control

Proposed Assessment Procedures

In order for standardized examinations to be useful to students and institutions, they must correspond to courses in

the curriculum. Without such correspondence it would be difficult for colleges to determine which courses should be waived and the areas in which the candidate needs additional instruction. Since there are no currently available tests which could be used to assess competency for the purpose of granting credit, a clear need is indicated for test development in each of the seven subject matter areas outlined in the previous section.

Among the seven subject matter areas of the field, two levels of priority for test development exist. Using the criteria of number of course offerings and number of technicians likely to receive off-campus training in the area, tests in the areas of basic electronics, AC and DC Circuits, digital techniques, and communications electronics should have higher priority than in the areas of electrical machinery, basic feedback control systems, and measurement and instrumentation.

Although they are quite traditional, paper-and-pencil tests appear to be the most practical and defensible measures to use. Consideration of non-test and non-paper-and-pencil tests revealed a number of logical and methodological problems which would make them unsuitable for assessment of competency on a standardized basis.

Performance tests enable the candidate to demonstrate his application of knowledge and his skills such as trouble-shooting, making adjustments and repairs, and using measuring instruments. Performance testing is important because an individual who has theoretical knowledge may not know how to apply it. Since a large part of electrical/electronics curricula is devoted to laboratory work, it would be useful to know the extent to which the candidate needs to partake in this activity. The disadvantage of performance testing is that electronic equipment is not standardized and the examinee who is not familiar with a particular brand or make of an instrument, such as an oscilloscope, may be at a disadvantage. Furthermore, performance testing is significantly more expensive than paper-and-pencil testing. It requires a high examiner-examinee ratio, expert evaluators and special instruments and equipment.

Another non-test measure which was given serious consideration is a standardized self-report checklist which would explicitly describe the various kinds of activities that technicians perform. Following specific instructions and guidelines, the candidate for credit would check those items on the list in which he feels that he is proficient and may report where and how he gained that proficiency. The checklist could be used as a guidance instrument to identify deficient or borderline competencies of the candidate which then could be

more formally tested. A number of questions, however, must be answered by research before proceeding with such a checklist. Will the candidate attempt to falsify the information? How can the checklist be evaluated? Does the candidate know his own training needs?

Assuming that a standardized paper-and-pencil test is developed, could it be used for purposes other than the granting of credit or placement in college? The most likely other use of such tests is for program evaluation. At least one state college system is currently under legislative mandate to evaluate its vocational-technical programs. Other states may follow. Standardized occupational competency tests would be appropriate for the employment or certification of electrical/electronic technicians. Employment selection tests should be based on job analysis and should be appropriate to the specific job in question. Tests based on the typical college curriculum are not likely to fulfill these requirements.

Implementation of Assessment Program

A case has been presented for the development of standardized examinations in at least 7 major areas of electrical/electronics technology for the purpose of granting credit and placement for candidates who have appropriate work experience. The following steps illustrate one model for the development and implementation of a nationwide competency assessment program.

1. The appropriate professional organizations such as the IEEE, ASEE and ICET could formally sponsor the program and rely on a professional testing organization for test development, administration and scoring, operational support and evaluation.
2. Funds for the developmental activities could be sought from private foundations or a government funding agency such as FIPSE. The Program would be self-supporting through candidate fees after the initial developmental period.
3. Initially, examinations will be developed in the four priority areas of basic electronics, AC and DC circuits, digital principles and techniques, and communications electronics. The test specifications and the items would be developed by a group of specialists in each area working with test experts to develop tests to meet the requirements of content validity.
4. The test would be reviewed by an independent advisory committee of persons teaching in the field.
5. The tests would be pretested at a representative sample of colleges. This procedure would detect faulty items, demonstrate the reliability and representativeness of the tests, and provide data for score interpretation.
6. The tests would be revised in accordance with the pre-test results and be made available to candidates on a nationwide basis at periodic intervals.

Summary of Identified Needs and Recommendations

The task force on electrical/electronics technology has identified several needs with respect to assessment of occupational competency and makes a number of recommendations for meeting those needs:

A. Identified Needs

1. There will be great demand for electronic/electrical technicians and technologists in the next decade and many employers will insist or give preference in employment or promotion to applicants with degrees.
2. Only one out of four persons who are currently working as technician has 2 or more years post-secondary education in his specialty.
3. Institutions of higher education, especially junior and community colleges, have a need for standardized competency measures to be used for granting credit or placement to their students.
4. Individuals are being trained in the field of electrical/electronics in a variety of off-campus setting including industry, military services, corporate and technical institutions, and correspondence schools. Many of these individuals will desire formal recognition in terms of degree credit for their competency.

5. There are no available standardized instruments or other procedures which can be currently used for awarding degree credit and placement to a competent technician.

B. Recommendations

1. In order to meet the needs identified, an examination in each of seven major areas of the field must be developed. Each examination would correspond to a typical course in the standard college curriculum.
2. The format of the tests should follow the paper-and-pencil format. Recognizing the importance of practical application of knowledge however, it is recommended that individual colleges develop their own performance testing procedures to assess the candidate's competency in application of knowledge; e.g. using instruments, troubleshooting, and making adjustments and repairs.
3. The standardized assessment program could be implemented on a nationwide basis under the sponsorship of one or more appropriate professional organizations in the field which would receive operational support from a professional testing organization.

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Prepared by:

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Education Testing Service
Princeton, New Jersey
May 1974

EXPLORING THE NEED FOR OCCUPATIONAL COMPETENCY MEASURES

TASK FORCE COMMITTEE POSITION PAPER

FIELD OF MANAGEMENT

May 21, 1974

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DELINEATION OF THE FIELD

Job descriptions and definitions were reviewed by the Task Force in their attempt to define the field. Among the documents submitted were those from the Trunkline Gas Company of Houston, Texas; the description of the "manager" as defined by the Administrative Management Society, Willow Grove, Pennsylvania 19090; the Uniform Guidelines on Employee Selection Procedures prepared by the Equal Employment Opportunity Coordinating Council; United States Civil Service Commission Job Analysis (developing the documenting data); several Career Service Authority, Denver, Colorado, job descriptions relating to management positions; a description of the educational assistance plan available at Trunkline Gas Company, and the 1974 catalog of training courses for exempt employees and supervisors for Panhandle Eastern and Affiliated Companies. Tests reviewed included "How Supervise?" manual, 1948 revision, by File and Remmers, Psychology Corp.; Test of Supervisory Judgment, Richardson, Bellows, Henry and Co., Copyright 1953; SRA Manual for Supervisory Index, Gekoski and Schwartz, Copyright 1960, Reorder No. 7-3911; Purdue Reading Test for Industrial Supervisors, Form A, Tiffin and Dunlap, Copyright 1955. Task Force members also reviewed an inspection copy of the CLEP Subject Examination in "Introduction to Business Management".

The Task Force wrestled for some time with a definition of terms, not everyone agreeing on whether the focus should be on supervisors, middle managers, administrative managers or top management and whether to target in on a broad, general definition of a manager versus specific fields such as finanical management, personnel, public relations, sales, systems and data processing - all of which are major components in the management field.

DELINEATION OF THE FIELD Continued

The definition of management as used in the Dictionary of Occupational Titles was thought by the Task Force to be the most universally accepted definition. (Refer to minutes of April 3-4 meeting.)

The Task force finally agreed, however, that for purposes of assessment, there are common areas of expertise required of everyone regardless of his position in the management career ladder.

IDENTIFICATION OF NEEDS

The areas or skills of those in the management chain vary in degree at different levels but not in 'kind'. Therefore, all management people have the same 'kinds' of duties and responsibilities which are:

Critical Management Areas	Critical Management Skills
Planning	Persuasion
Organizing	Writing
Directing (Leading)	Speaking
Controlling	Listening
	Arbitration
	Conciliation
	Comprehension
	Negotiation
	Decision Making

In terms of business and industry, the Committee felt that many individuals in low-level management have the basic skills but require more knowledge. A competency measurement assessment would provide incentive and alleviate surplus in low and mid-level management and attempt to provide the needed supply at top level. By the same token, each individual operates at a different pace -- those who want to run faster should not be penalized - an instrument to measure competency would get them to their goal faster.

Since most major industrial companies look for people with managerial potential in their recruiting program, the college transcript is examined to see if it contains a sufficient number of behavioral science courses in addition to courses that expose

IDENTIFICATION OF NEEDS Continued

the student to the theory and language of the management field. Therefore, the Task Force felt that it ought not to deal with technical skills applicable only to one of several specific positions in the management field. If one accepts the concept of management to be a "human" chain consisting of all who share the responsibility of getting other people to work, then the management team must be able to determine what the problems are and call upon a reservoir of usable knowledge to achieve a satisfactory solution.

It was felt that most individuals going into management after 2-year and 4-year degrees have too little practical knowledge and end up in the middle of the decision-making process. Many of the problems a young graduate encounters on the job cannot be simulated in the classroom; consequently, a person entering a production oriented company must be exposed to the in-house training programs before he begins his supervisory career.

Even so, the degree is usually the first item placed on a job specification since it is the most familiar and convenient way of equating potential knowledge. Then the candidates work experience is reviewed. However, a compromise is being made in the management field. Four-year requirements are being modified in terms of granting more credit for work-related experience. Thus, there appears to be a small, but noticeable, trend in government, business and industry to hire away from degree.

Task Force members were in general agreement that:

Personal growth and job advancement does not come about only through job related skills.

IDENTIFICATION OF NEEDS Continued

Pre-retirees are among those individuals that a competency exam would motivate to continue education and obtain a formal degree.

Business recognizes the value of a more learned, well-rounded individual and will generally support those employees seeking a degree even if some courses do not have direct job relationship.

Society should be able to provide a college degree for the individual who possesses knowledge and wants formal credit and recognition.

Collegiate institutions should offer more courses in management training. In the curricula, practical application should be taught along with theoretical knowledge to assure that the student is not left with only a theoretical knowledge and is set out into the world of reality to learn practical knowledge on his own. A competency examination could help guide institutions to provide courses with increased job-related knowledge and performance.

While some institutions are recognizing the need for and implementing a closer relationship with the action in business and industry, it was believed the majority of institutions and faculty prefer to stay at a consultant level, rather than helping business get to the cause of their problems. Colleges must recognize the rapid increase of alternative sources of education and that it would be to their advantage to accept the challenge to meet the needs of business and industry.

IDENTIFICATION OF NEEDS Continued

Since companies need and want the most qualified and competent individuals to fill their vacancies in management they recruit with individual potential in mind. It was felt there would be less in-house training if institutions offered more direct business-related courses in the management curricula. There is movement by business to get college credit for in-training courses in business and industry and a universally accepted competency instrument would be the most practical and economic way to achieve the transfer of job-related knowledge.

Although a universal examination (CLEP) is now offered for academic courses, there is a need for instruments to recognize other fields (vocational courses) so as to enable individuals to receive credit for work experience as well. It is the usual practice for colleges to allow challenges to formal courses but the tests are heavily text book oriented, based on theory, and the content and level of difficulty is uneven among institutions. Also, they are available only when an equivalent course is offered by the institution.

A professionally developed, standardized, valid, job-related competency measurement can contribute significantly to sound personnel selection for any employment decision, including hires, transfers, promotion, demotion, training, referral and retention. In addition, it would aid in the development and maintenance of an efficient work force and in the effective utilization of human resources.

IDENTIFICATION OF NEEDS Continued

An occupational competency measurement device (used either by itself or in conjunction with other tools of personnel assessment) could be useful in implementing equal employment opportunity requirements and personnel administration based on merit principles. Those required to comply with the Uniform Guidelines on Employee Selection Procedures are: private, state and local government employers, labor organizations and employment agencies covered by Title VII of the Civil Rights Act of 1964, as amended, and by Executive Order 11246, as amended, and all state and local government agencies under specific requirements by the U. S. Civil Service Commission. Affirmative Action under Title VII of the Civil Rights Act of 1964, as amended by the Equal Employment Opportunity Act of 1972 (Pub.L92-261,86 Stat.103), and Executive Order 11246, as amended by Executive Order 11375, is the obligation to take positive action to afford equal employment opportunities to ensure that applicants or employees are treated without regard to race, color, religion, sex or national origin.

IDENTIFICATION OF AVAILABLE RESOURCES

AMA - American Management Association - provides Supervisor I & II tests which includes concepts that look at both sides of the picture.

AMS - American Management Society, 135 West 50th Street, New York, NY 10060 - Sponsors CAM (Certified Administrative Manager) program which through a comprehensive exam equates certification with study programs; however, exam not all theory and candidates must have experience to pass. The average age of the participants taking the exam is now 57; however, committee thought it was a matter of pride and average would go down.

CLEP - College Level Examination Program, sponsored by CEEB.

CSA - Career Service Authority for the City and County of Denver, Colorado - has manual listing levels of management.

CSU - Colorado State University, Fort Collins, CO - has competency examination given with credit for work experience. Contact: Mr. Joseph Roberts, Teacher Educator
Department of Vocational Education
Colorado State University
Fort Collins, CO 80521

GED - Grade Equivalency Diploma - is a competency examination and the committee believes there are various supervisor guides and tools available pertaining to preparation for sitting for this exam.

IPMA - International Personnel Management Association - Mr. McDermott has checked with the employment officer on supervisory testing and gotten in touch with

IDENTIFICATION OF AVAILABLE RESOURCES Continued

Chicago and they do not have any supervisory tests available.

McBee and Company - 675 Massachusetts Avenue, Cambridge, Massachusetts - is a management motivation consultant firm.

METRO - Metropolitan State College, Denver, CO - should be contacted since it is believed they have instrument for granting credit.

MSEC - Mountain States Employers Council, 1790 Logan, Denver, CO - although it was not known if they had testing instruments, they do provide resource and information services to and for management.

NBEA - National Business Education Association, 1906 Association Drive, Reston, VA 22091
Contact: Dr. O. J. Burnside, Telephone: (703) 860-0213

NAPA - National Association Personnel Administrators

Port of New York Authority - Felix Lopez should be contacted. (Developed in-basket type exam for management)

Problem and Decision Analysis by Kepner-Trigoe, University of Oklahoma, has course on solving problems with no knowledge of area.

Psychological Corporation of New York

IDENTIFICATION OF AVAILABLE RESOURCES Continued

SRA - Science Research Associates

Transactional or Transitional Analysis Institute - Los Angeles, CA - Transactional analysis in business.

Trunkline Gas Company, Houston, TX - has examination which measures management by objectives competency - also has individual and group effectiveness tests.

United States Civil Service Commission - has sponsored research in analysis of job identification.

University of Oklahoma - should be contacted for information concerning instruments used in granting credit and introductory supervisor training courses.

Wayne State University, Detroit, MI - should be contacted regarding instruments used in granting credit.

Franchises - those which have management training programs should be investigated,

Example: 1. McDonald's
2. Burger King
3. Holiday Inns

since these managers must have a picture of the complete operation as they perform all functions of management and labor.

INSTRUMENTS CURRENTLY AVAILABLE

AMS - Administrative Management Society CAM - Certified Administrative Manager

The Administrative Management Society, founded in 1919 as the National Office Management Association, counts 15,000 members in 165 chapters throughout the world.

The AMS has developed a professional accreditation program which includes a series of uniform examinations covering the following areas of management:

1. Personnel
2. Financial Control & Economics
3. Administrative Services
4. Systems & Information

A fifth part of the examination is taken only after a candidate has successfully completed parts one through four. It is an in-depth case study incorporating the various management skills. The candidate has 30 days to prepare and submit his solution to the problem.

The Task Force felt, however, that for the general population in the field of management that the AMS' C.A.M. Program was clearly at both the advanced educational and professional end. What was suggested as an alternative was a two-level examination for competency measurement. The instrument should be designed to bring out both strengths and weaknesses within each individual. Perhaps the same instrument could be used on the campus as a measurement of competency learned in course work as well as a measurement of competency learned on the job.

INSTRUMENTS CURRENTLY AVAILABLE Continued

CLEP - College Level Examination

Two types of examinations available - essay and objective - which are equivalent to a one-year formal course in business management. This test measures knowledge of theory.

The CEEB, through its College Level Examination Program provides an examination in business management. This examination is based on material usually taught in an introductory one-semester course in the principles of business management and organization. Such a course is offered in various kinds of institutions, including collegiate schools of business administration and community colleges. The questions deal with such topics as manpower and human resources (personnel, collective bargaining, human relations, and so forth), operational aspects of management (production planning and control, quality control, methods and time study, operations research, inventory control, and so forth), functional aspects of management (planning, organizing, directing, controlling), and miscellaneous aspects of management (history, finance, social responsibilities, and so forth).

CSU - Colorado State University, Fort Collins, CO Competency Examination given with credit for work experience.

The occupational competency examination is given as part of the determination of university credit for vocational work experience. Qualifying students must have completed 48 college quarter-hour credits (24 of which must have been earned at CSU). (Refer to minutes of April 3-4 meeting).

INSTRUMENTS CURRENTLY AVAILABLE Continued

Students with three or more years of work experience may be granted college credit on the following basis:

3 years of acceptable work experience --maximum 39 credits

4 years of acceptable work experience --maximum 52 credits

5 years of acceptable work experience --maximum 64 credits

The amount of the above credit is to be determined through the rating plan of the Committee on Undergraduate Work in Vocational Education. If such credit is obtained, 9 additional credits may be granted for three (3) years of successful teaching experience in the field. A year of teaching experience is considered to be a school year of nine (9) months.

The credit for vocational work experience which includes the occupational competency exam at CSU does not become a substitute for required college curriculum subjects as it is applied to electives only, nor does the credit affect a low grade point average. It is also our understanding that business and industry in-training courses are not recognized in evaluating credit for the vocational work experience.

SUGGESTED PROCEDURES FOR IMPLEMENTATION

In general, the Task Force felt that if funding were provided for the development of a valid instrument and one beneficial to all concerned, a better means of communication is needed between business, industry and educational instutions. Perhaps because of their mission and recent development, most two-year community and junior colleges seem to have established a better liaison with the community they serve than have many four-year colleges. But the point made is a valid one.

Competency measurement in the field of management should include decision-making cases since management involves decision making, solving problems and knowing where one can get enough information to get the job done. Effective management comes with exposure - the day to day development in human relations; so some method of assessing in this area should be included. Finally, the instrument should be designed to bring out weaknesses as well as strengths.

Specifically, the Task Force recommends that:

1) The work experience of the applicant, educational objectives, record of formal education, and company-sponsored training courses, should be verified before examinee is allowed to sit for competency measurement examination. A student applying for college credit through a competency measurement device should be required to have made a definite declaration of intent and perhaps be required to complete a specific number of credit hours on campus before the institution would grant competency measurement credit.

2) Business and industry looks for individuals with a high degree of human

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

relations competence since the coordination of people in working toward a common goal is an important part in management. It was felt two-year institutions should provide more courses in the behavioral sciences, for in actual practice effective management demands behavioral skills as well as technical skills and both should be encompassed in the competency measurement device.

3) While sequence of courses are not always similar in two and four-year institutions, this should not be a hindrance in the acceptance of a competency measurement device if the content covered the critical areas in both behavioral and technical skills, however, it might necessitate a junior student in a four-year degree program to take some freshman and sophomore courses.

4) Ideally, the competency measurement should be put together by members representative of all areas of the United States in addition to the expertise present in the task force committees.

In discussing the validation, there was some question as to whether this would be necessary if it were to be used only for college credit. In validating the instrument, the performance of an individual that received his knowledge by traditional study would, of necessity, have to be compared to the score of the individual who received his knowledge through non-traditional study if colleges were to readily recognize the value of the instrument.

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

5) To comply with EEOC (Equal Employment Opportunity Commission) Guidelines test construction must include, but is not restricted to, measures of: general intelligence, mental or learning ability, specific classes of aptitudes or abilities, dexterity and coordination, knowledge and proficiency, attitudes, personality or temperament, and job skills.

Criteria and rating techniques should be examined to insure freedom from factors which would unfairly inflate or depress scores of any group (namely, any sex, racial, or ethnic groups) of examinees.

In validating the examination for compliance with the Uniform Guidelines on Employee Selection Procedures, the exam must measure the knowledges, skills, abilities and other worker characteristics necessary for successful job performance or prediction of successful job performance.

Three equally acceptable kinds of validation methods as defined in the American Psychological Association Standards for Educational and Psychological Tests and Manuals are: Criterion related, Content and Construct validity. If other professionally acceptable means of validation are developed, these new techniques will be evaluated to determine their consistency with the purpose and principles of these guidelines.

An employer, labor organization or employment agency may be permitted to utilize a test operationally which is not fully supported by the evidence of validity required, but such use is proper only if the employer, labor

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

organization or employment agency will produce, within a reasonable and specified time, the additional data required.

6) The use of the language of business in construction of the instrument was stressed and re-emphasized by the Task Force Committee.

7) The test content must be general enough to accommodate the largest percentage of customers. It must apply to a variety of jobs. Test should be a two-level exam to fall within the freshman and sophomore, Junior college level; also guidelines for each examination should be provided, all of which would make the instrument more acceptable at institutions and helpful to individuals.

8) The various methods of optional review and test approach considered were films (including sound), books and cassettes. In films the most effective method could be shown for examinee's review as well as role playing to show responsive reactions (bodily as well as physical).

9) The use of cassettes would cover several of the critical skills and would be an effective method of testing with the problem being presented on a cassette; it would test an individuals listening skill and, if he were to dictate his answer on the machine it would, among other things, test his speaking skill (vocabulary, comprehension, persuasion, decision-making ability - how he plans, organizes, methods of self-expression). Perhaps the individual is a poor speller - it would alleviate tension

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

and concentration in this area so individual, as a manager, could put forth concentrated effort in his field - management.

10) The competency measurement device should include problems that are not too complex so it could definitely be determined the individual recognizes there is more to be considered in a situation than resolving a problem with a mass of information. However, some problems should include a mass of information in order that the examinee has to diversify, take apart and solve piece by piece, and decide which pieces are foremost and important and which are irrelevant.

11) A set of case problems could be a segment of the examination whereby examinee would have to respond in terms of the course of action he would take. Some case studies could be given whereby individual would have to make decision on available information only.

12) Grading and content of exam would have to be given careful consideration to assure that the examinee has satisfied the prerequisites for formal courses at institutions.

In grading the competency exam if an individual applies certain predetermined basic principles he should be considered qualified even though his approach may not be the route another manager might follow. In management there are various alternatives and no cut and dried, yes or no answer.

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

The use of advisors and review panels in evaluating the results of the examinees competency was discouraged by the Task Force Committee and deemed too time consuming and expensive.

13) Competency measurement exam must be easily converted to credit hours and/or specific courses. Perhaps a maximum of credit hours could be established with several rankings whereby individuals with lesser degrees of occupational competency in management would not receive the full spectrum of credit. Before a decision can be reached as to the value of the occupational competency measurement in terms of hours of credit at educational institutions or the relation of the competency measurement to content of college courses, a more concentrated effort and study needs to be made.

14) Endorsement of the competency measurement mechanism by business organizations, professional associations such as AMA, AMS, as well as labor organizations, federal and state educational agencies and federal and state government agencies, must be secured. The Task Force discussed, but did not resolve the implementation to see that the necessary support of all concerned would be generated.

15) It was the opinion of the Task Force Committee that outstanding leaders or lecturers would not be useful to advance the concept of occupational competency measurement and recognition of non-traditional study.

TASK FORCE POSITION PAPER

POLICE SCIENCE

July, 1974

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TASK FORCE POSITION PAPER

POLICE SCIENCE

I. Delineation of the Field

A. Structure of the Field

The task force committee determined that an effective way in which to delineate the police science field is by means of a task analysis. An assessment is made of the extent to which specific tasks that occur with some frequency in the field (as determined by a survey such as has been performed by the State of Texas) are also present in the content and goals of collegiate programs and/or training programs in police academies. Those aspects of the field which either (a) lie outside the usually defined tasks of the police officer in his daily activities or in his academy training, or (b) are not part of the usual academic curriculum in the police science field should not, for the purposes of this task force, be considered part of the police science field.

In order to determine if the task analysis procedure could actually be used in a program for collegiate crediting of vocational competencies gained in the field or through academy training, a questionnaire was developed to assess the task overlap between occupational experience, training in academies, and instruction in collegiate settings. Three specific areas of police science were selected for the questionnaire: (a) traffic control and regulation, (b) criminal law, and (c) community relations. These three areas were chosen because of their diversity in terms of the extent to which they are likely to be considered appropriate topics for academies and col-

leges and the extent to which tasks related to these areas tend to be performed by police officers. The tasks in each of these three areas were chosen from among those defined by the State of Texas in an extensive task analysis. Specific tasks were chosen for the three areas which appear to bear some relevance to the area. In a more formal version of this procedure, a more careful selection of relevant tasks would have to be performed. Our intention was merely to sample a portion of the field as a basis for further activity. Copies of the three questionnaires are enclosed in the appendix to this report. These were sent to a small sample of colleges, along with a questionnaire which would indicate institutional acceptance of crediting for life experience (referred to again in II.A. below). Copies of the three questionnaires were also sent to a small sample of police academies.

Results of the three questionnaires on specific occupational areas generally reveal that many of the tasks performed by "on-the-job" police officers are included in the curriculum of at least some colleges and police academies (see Appendix A for full account of questionnaire results). This fact would seem to indicate feasibility of a procedure to translate life experiences or police academy training into related collegiate credit. The results also indicate in a preliminary manner, however, that the police academies and colleges vary quite widely in the specific tasks that are covered in their courses. In a number of instances, one college or academy will emphasize aspects of a subject that are considered peripheral by another institution. This fact complicates the assessment task, since colleges that offer police science may not be able to readily agree on

which tasks are particularly important in the assessment of past life experiences. While similar problems were undoubtedly encountered in the development of other academic assessment procedures (e.g., CLEP), this problem might be particularly difficult in police science where practices in the field and demands for vocational competency vary widely from one geographic region to another, from urban to rural settings, and even from one department to another.

In general, the task-analysis/questionnaire procedure seems to be a valuable tool in the first steps of developing a formal assessment procedure for academic crediting in this field. Furthermore, the task lists developed by the State of Texas may be appropriate for the more formal development of task questionnaires. The task lists that have been developed by the STAR (Systems Training Analysis Requirements) project in California could also prove useful.

A concern that is related to those addressed in the task analysis centers on the issue of job level: should the assessment procedures be developed specifically for the police officer who is on patrol, walking the beat or manning the desk, or should procedures be developed for the management-level police officer. If this latter level is addressed, then we may be talking about baccalaureate or master's degree level crediting, for many officers at this level already have Associate of Arts or Bachelor's degrees.

B. Related Disciplines

Police science, like other social service activities, embraces a number of different disciplines, including psychology, sociology, law, and even medicine. Members of the task force indicated that to the extent that police officers could get credit for life experiences in the

related disciplines, they would be free to engage in advanced learning either in police science courses or in these related disciplines.

C. Future Outlook for the Field

Members of the task force indicated that the field of law enforcement is constantly changing, both because the social and political systems within which police must operate are changing and because the field itself is becoming increasingly professionalized. The area of community relations was identified as one which would be of increasing importance in the future. Mention was made of drug-related crime as a separate area which has become increasingly important and may continue to be important in the future.

From a future perspective, at least one task force member noted that the increasing professionalization of police and the growing emphasis on selecting degree-holding candidates to positions on police forces may mean that there will be very little need for an assessment procedure that generates or leads to undergraduate credentials. In this sense, the assessment procedure may serve as a "grandfather clause," in terms of providing academic credit for those police force members who were recruited before the baccalaureate degree was a job requirement.

II. Identification of Needs

A. Institutional Needs

The members of the task force who were present at the final meeting generally agreed that many academic institutions would welcome a formal, nationally recognized procedure for assessing vocational competencies in the police science field. Several members of the task force are currently involved in projects that could make immediate use of the procedure. The

task force members at the first meeting, however, recommended that there be at least a preliminary survey of institutional needs before the second meeting.

A questionnaire was drawn up (see appendix A) which requested a small sample of colleges offering police science programs to indicate whether or not they now offer credit for occupational experience acquired by police officers or would be willing to accept a national procedure for such crediting arrangements. Results from this questionnaire, while preliminary, confirmed the opinions of the task force committee that there is an institutional need for this type of procedure but indicated that the need might be more appropriately met by individual institutions through their own specific assessment procedures rather than through use of a common national procedure. This conclusion is based on the fact that many institutions already offer some form of advanced placement or credit for relevant past experiences in police work and from the fact, as indicated in I. A. above, that colleges vary considerably in what they are liable to accept in terms of demonstrated vocational competencies.

A somewhat less positive assessment of institutional need comes from one member of the task force who pointed out that a large proportion of police officers are already involved in some form of postsecondary education (estimate of 25% in the Philadelphia police and 75% in California). While this high level of current participation does indicate that colleges must be responsive to the educational needs of police officers (hence, may be foresighted in developing a procedure for assessing vocational competencies), these colleges do not apparently have to be responsive in terms of trying to draw the police

officer back to college. Other interests seem to provide the necessary impetus: pay incentives, educational allowances, professionalization of the occupation, demand for continuing education in an expanding field, etc. Thus, to the extent that the proposed assessment tools are being used as incentive devices for encouraging enrollment of police officers, they may be of little or at least diminishing value to many institutions (particularly those with high rates of current enrollment, such as in California).

In conclusion, a much more extensive feasibility study was strongly recommended by the task force before any steps are taken to assemble an assessment procedure. Such a feasibility study would not only ensure that these types of procedures are wanted but would also ensure ownership by the colleges for such procedures.

B. Individual Needs

At both meetings, almost all the members of the task force were of the opinion that most police officers would look favorably upon this procedure, given the numerous advantages associated with academic credit. Police officers are usually hard pressed to find time for any postsecondary education; and most would welcome a procedure that could generate credit through assessment procedures over a short period of time.

A critical issue in this regard may be the ruling by each regional LEEP (Law Enforcement Education Program) office as to the availability of LEEP funds for officers who are receiving academic credit through the proposed assessment procedure. Without LEEP funds, many police officers would not be able to attend college. Each LEEP regional office operates with considerable autonomy,

making a national policy difficult to either obtain or implement.

Of equal concern is the reaction of police department chiefs to this program. While many law enforcement administrators encourage members of their departments to continue their formal education and provide pay incentives in support of that encouragement, they may look upon the proposed assessment procedure as a tactic whereby members of the department receive the pay incentives without having acquired any new knowledge or skills, since assessment is for knowledge and skills already possessed.

III Identification of Available Resources

Members of the task force were not able to identify any specific tests or alternative assessment devices that would be directly applicable to this project. They did, however, acknowledge that the task analysis procedures developed by the State of Texas will lead to the development of relevant assessment procedures and that the curriculum and training materials that have been developed by STAR would be at least indirectly relevant to the proposed program. Finally, given the active role of ETS in past assessment programs for the field of police science, their active role in this project was deemed particularly appropriate.

IV. Identification of Competencies

At several points in the task force meetings, attention was focused on the issue of what types of competencies should be assessed and what form or mode of expression is acceptable for assessing those competencies. A strong argument was made for on-the-job assessment

of competencies, i.e. performance-based criteria. While all members of the task force agreed that competency must be assessed as it takes place on the job and in terms of satisfactory performance of specific predetermined tasks, there was a generally accepted recognition of the fact that collegiate institutions can not and should not assume responsibility for on the job performance. The college can only assess the potential of a former student to perform a job of some sort. The actual performance is influenced by many variables beyond the control of the college, e.g. work environment, job constraints, values and norms of the organization and/or the clients, etc. If a college can only assume responsibility for imparting knowledge that is potentially of use on the job, then it cannot expect a student who wants to be assessed for past experience to be able to exhibit job competency as well as knowledge of the field. While these two poles (knowledge and performance) are never exhibited in isolation, it is important that an assessment procedure which measures past experience not be significantly more demanding than an assessment procedure which measures knowledge derived from classroom experience. Given this conflict, it may be well for initial efforts at assessment to focus on knowledge-based rather than performance-based criteria, since application of standards in the knowledge area is more uniform than in the performance area.

In addition to knowledge and performance skills, members of the task force discussed the role that should be given to attitudes and values in the proposed assessment procedure. Many college teachers in police science as well as other areas indicate that attitudes

or orientations are among the most important things they are trying to convey to their students. Many faculty members might reject a national assessment if it failed to convince them that the police officer being tested has embraced and fully incorporated a specific set of attitudes, orientations, and values. Since each faculty member has individualized ideas about what this set of values should be, the assessment procedure becomes quite complex, if not impossible. This fact may point to another possible advantage of individualized, institutionally based assessment procedures.

Task force members also expressed their concern with the validity of procedures for assessing attitudes. Can we accurately make such an assessment by simply asking the student. What is to ensure that he is saying what he believes rather than what he knows will meet with the examiner's approval. Can we accurately infer attitudes, values, and orientation from an officer's daily activities? How do we differentiate between the values of the officer himself and the values or norms of the community in which he works and which he is committed to serving and representing?

In conclusion, members of the task force supported the concept of multi-level assessment. One must look not only at knowledge of police science, but also performance and attitudes. On the other hand, the dissemination of knowledge is the primary mission of the vocational college program and must be given a dominant role in any assessment procedure that leads primarily to academic credit rather than vocational licensing, job advancement, etc.

V. Determination of Assessment Procedures

In the development of new assessment procedures, the task force recommended three different modes: (a) paper and pencil tests, primarily to assess knowledge base; (b) performance-based tests, using simulations and stop-action video tapes; and (c) job inventories, whereby the student indicates in some detail the type and extent of job activities he has performed that are related to the area being assessed.

The task force indicated several possible sources of currently available paper and pencil tests and recommended a survey of police science departments in American colleges in order to identify and collect currently available instruments. In regard to the performance based assessments, members of the task force identified several relevant procedures that are currently being used primarily for training purposes. A specific crime scene is dramatized and recorded on movie or video tape. The student views the movie or tape which is stopped at a given point. The student is then required to either indicate in written form how he would react at this moment or, preferably, indicate by means of demonstration on a dummy or trained subject how he would respond in this particular situation if it really occurred. While this performance based procedure might be rather time consuming and expensive, it was suggested that costs could be kept relatively low by establishing a statewide or regional testing center for this segment of the assessment procedure.

The job inventory was recommended as a means of systematically and thoroughly assessing the nature and extent of the student's past experience. Such an inventory would probably consist of a checklist

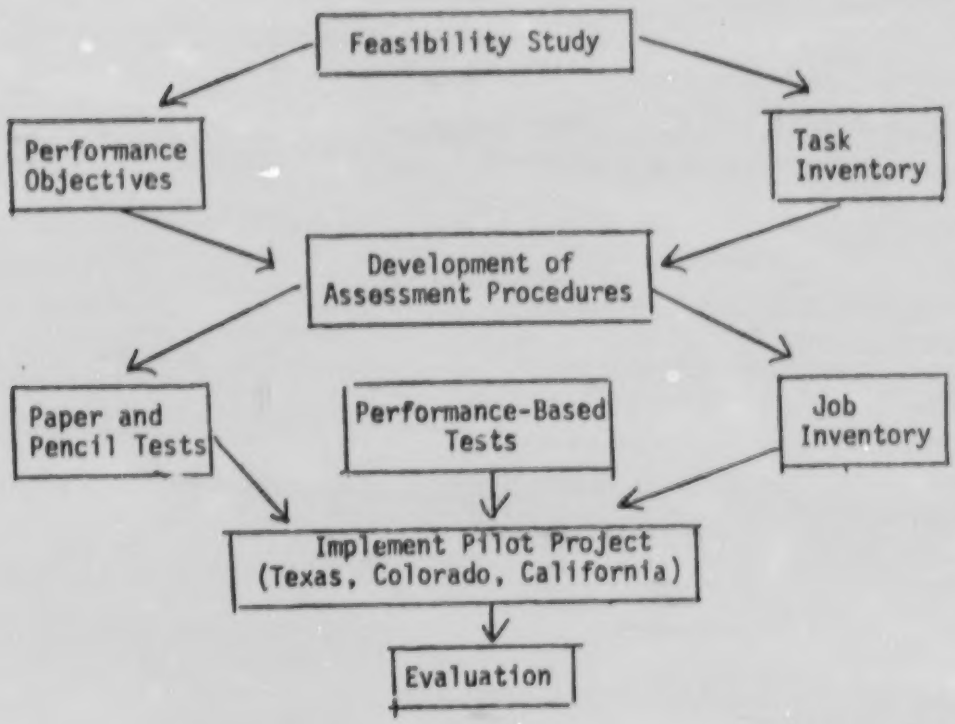
of job-related tasks, a set of supervisory recommendations and/or check-ups for accuracy of the checklist, and transcripts of a vocational analysis interview with the student.

VI. Suggested Procedures for Implementation

The task force, at its second meeting, tentatively recommended that a full-scale project be initiated that would result in the development of an assessment procedure whereby life experiences and police academy training could be formally acknowledged as college credit. Furthermore, the task force recommended that this project be started on a pilot phase in cooperation with three states: Texas, California, and Colorado. The first two of these states are among the most progressive in terms of training, education, job analysis, and certification in the field of police science. The expertise and services of police officers and educators in these two states is vital in preventing inefficient redevelopment of already existing procedures. The state of Colorado represents a "typical" environment in which the new assessment procedures might be pilot tested. Vital and progressive leadership can be identified in this state, thus maximizing the chances of project acceptance.

Several regional and national agencies might quite appropriately be brought into this project: ETS, CEEB, WICHE, IACP (International Association of Police Chiefs), NASLET (National Association for State Law Enforcement Training) and LEAA (Law Enforcement Assistance Administration). The "Report on Police" by the National Advisory Committee on Criminal Justice Standards and Goals will also provide valuable guidance, particularly with reference to the feasibility of the project.

The following flow chart was recommended by the task force as a general strategy for implementation of the project.



Feasibility Study: determine if assessment instruments are needed in the police science field, surveying a national population.

Performance Objectives: determine what skills police officers should have acquired upon completion of a police science curriculum.

Task Inventory: determine what skills police officers typically acquire after a certain number of years of employment and in certain areas of specialization.

Development of Assessment Procedures: a battery of pilot instruments are developed by personnel in the States of Texas and California in cooperation with personnel from the State of Colorado and with assessment specialists from the Educational Testing Service and College Board.

Paper-and-Pencil Tests: assessment of knowledge by means of multiple choice, true-false, short answer type questions.

Performance Based Tests: assessment of students by means of simulations, on-the-job observations, etc.

Job Inventory: assessment of job-related past experiences using check-lists, portfolios, etc.

Implement Pilot Project: the pilot instruments are tested in the State of Colorado and also in the States of California and Texas (though results from Colorado are probably most critical in appraising nation-wide use).

Evaluation: determine the acceptance and effectiveness of the instruments after a designated pilot period (two - three years).

An approximate cost of $300,000 - $400,000 was envisioned for this project, with several federal agencies and private foundations being identified as possible sources for part of this money. The three states might each be able to provide $30,000 - $40,000 over a three-year providing a total state revenue of $90,000 - $120,000.

The project is envisioned as a three-year venture, with the pilot implementation beginning by the middle of the second year. The task force recommended heavy involvement of state law enformcement agencies, local police departments, and the participating colleges. While the project should be interstate in nature, the task force recommends that initial contacts should be made by people within each state. Members of the task force identified themselves as being among those in each of the three states who might make these initial contacts and provide at least initial leadership in the project.

APPENDIX A

Questionnaire Results

The attached questionnaire was sent to a small sampling of police academies and colleges with programs in police science within the 13 western states serviced by WICHE. The questionnaire reflects the tentative nature of the task force in process and was intended to serve as a tool for suggesting possible directions for the task force committee.

The first part of the questionnaire (Request for Information) is intended to provide an indication of the extent to which the responding institution currently is involved, or is willing to become involved, in credit-for-experience programs. The second major part of the questionnaire (Course Content Survey) is designed to ascertain the extent to which specific tasks performed by police officers are related to the instructional goals and content of institutional curricula.

The following institutions responded to the questionnaires.

Colorado Law Enforcement Training Academy
Colorado State Patrol Academy
East Los Angeles College
Modesto Junior College
Northern California Criminal Justice Training and Education System
Sacramento Center - Los Rios Community College District
Philadelphia Community College
Santa Rosa Junior College
Trinidad State Junior College

Not enough "Request for Information" forms were returned to warrant a statistical breakdown. In summary, however, the following points were made on those forms that were returned.

(1) The respondents' descriptions of their academic responsibilities related primarily to administration, teaching, and in-service training programs.

(2) Mention was made of the "Challenge" system whereby the student may take an examination or a series of tests devised by the college in order to gain credit for experience based knowledge. A single respondent indicated that his institution would grant credit for experience provided the student successfully completed a paper in some area of his specialty and passed an oral or written examination.

(3) It was noted that California Community Colleges operate law enforcement recruit training schools which grant academic credit.

APPENDIX A

COURSE CONTENT SURVEY

SCALE: 0 = irrelevant 1 = a few will learn 2 = many will learn
3 = most will learn 4 = essential

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academies
1. Plan and direct selective traffic enforcement work	2.3	2.0	8	5
2. Supervise adult school crossing guards	1.0	2.0	13	5
3. Supervise breakdown and study of traffic law enforcement and accident data	1.5	1.5	11	6
4. Supervise collecting traffic volume counts	0	1.5	17	6
5. Supervise directing and controlling traffic	2.3	2	8	5
6. Supervise investigation of accidents	3.0	2	5	5
7. Supervise investigation of hit and run accidents	3.0	2	5	5
8. Supervise issuing of traffic citations	3.5	3	3	3
9. Supervise student safety patrol program	2.0	1.5	9	6
10. Supervise traffic case preparation	1.8	3	10	3
11. Supervise traffic law enforcement patrol tactics	2.8	2	6	5
12. Suggest changes in traffic control procedures	2.3	2.5	8	4

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academies
13. Participate in driver education courses in public or private schools	2.3	1.5	8	6
14. Provide traffic safety education to the public	2.3	2.0	8	5
15. Administer field tests for intoxication (coordination tests, etc.)	3.5	4.0	3	1
16. Advise parents of childrens' violation of traffic laws	3.3	4.0	4	1
17. Apply first aid	2.5	4.0	7	1
18. Assist citizens with emergency cases	3.5	4.0	3	1
19. Check autos against stolen car list	3.0	4.0	5	1
20. Conduct airborne traffic surveillance	.3	.5	16	8
21. Conduct traffic law enforcement patrols	3.0	3.0	5	3
22. Conduct off-street (out-of-view) observation for traffic law violators	2.3	.5	8	8
23. Conduct open observation for traffic law violators	3.3	3.5	4	2
24. Interview pedestrian traffic law violators	3.0	4.0	5	1

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academies
25. Interview traffic law violators	3.0	4.0	5	1
26. Issue citations for mechanical defects on motor vehicle	2.3	2.5	8	4
27. Issue moving traffic citations	2.5	3.5	7	3
28. Issue moving traffic citations to bicycle riders	2.3	3.5	8	2
29. Issue warning tickets	3.3	2.0	4	5
30. Operate radar to identify violators of speed laws	2.5	2.0	7	5
31. Patrol freeways	2.0	2.0	9	5
32. Work driver license check points	1.3	2.0	12	5
33. Call for supplementary aid (e.g., wreckers, fire department) for traffic crashes	2.5	3.5	7	2
34. Carry traffic crash victims to hospitals	2.8	4.0	6	1
35. Check crashed vehicles for evidence of mechanical defects that contributed to crash	2.0	4.0	9	1
36. Clean up traffic crash scene to the extent necessary to prevent debris becoming a traffic hazard.	3.5	3.5	3.	2
37. Collect traffic crash evidence	3.5	4.0	3	1

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academies
38. Conduct follow-up on hit and runs	3.0	2.0	5	5
39. Conduct preliminary investigation on hit and runs	3.0	2.0	5	5
40. Contact next-of-kin in traffic crash investigations	4.0	1.5	1	6
41. Control spectator access to traffic crash scene	3.0	4.0	3.	1
42. Determine key or crucial events related to the traffic crash	3.3	4.0	4	1
43. Determine point(s) of impact or point(s) of occurrence	3.0	4.0	5	1
44. Determine secondary collisions or secondary points of impact in traffic crashes	1.8	3.5	10	2
45. Diagram and record measurements of traffic crash scene	3.0	3.0	5	3
46. Dispose of personal property following a traffic crash investigation	2.8	1.5	6	6
47. Estimate driver(s)' capability to drive	2.8	3.5	6	2
48. Follow-up on nature and extent of personal injuries resulting from traffic crashes	1.8	2.5	10	4
49. Interview victims and those involved in traffic crashes	3.3	3.5	4	2
50. Interrogate traffic law violators involved in traffic	3.5	3.0	3	3

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academies
51. Investigate traffic crashes associated with aggravated assault	2.3	3.0	8	3
52. Investigate traffic crashes associated with commission of a crime	2.3	3.0	8	
53. Investigate traffic crashes reported late	3.0	3.0	5	3
54. Locate, interview, and establish credibility of witnesses to traffic crashes	3.3	2.5	4	4
55. Move (or arrange for moving) damaged vehicles	3.3	3.5	4	2
56. Photograph accident scene	3.0	2.0	5	5
57. Prepare narrative reports on traffic crashes	3.3	2.0	4	5
58. Protect traffic crash evidence for collection	3.8	3.0	2	3
59. Record driver(s)' condition and appearance	3.8	4.0	2	1
60. Record location and description of skidmarks, glass, and broken off parts in traffic crashes	3.3	4.0	4	1
61. Record location of traffic control devices	3.3	2.0	4	5
62. Record motor vehicle damage in traffic crashes	3.3	2.0	4	5
63. Record nature of sight obstructions	3.3	2.0	4	5

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academie
64. Record visibility conditions at time of accident	3.3	3.5	4	2
65. Record type and condition of road surface	3.3	3.5	4	2
66. Request assistance from traffic crash investigation	2.8	2.0	6	5
67. Request mechanic to test vehicles involved in traffic crash	2.8	.5	6	
68. Request witnesses or violators to submit written reports or accounts of occurrence in traffic crashes	2.8	1.0	6	7
69. Reroute or direct traffic around traffic crash scene to prevent further crashes or injury	3.5	3.5	3	2
70. Send traffic crash evidence to lab for analysis	3.5	3.0	3	3
71. Survey or cause to have surveyed accident scene	2.8	2.5	6	4
72. Take statements or depositions from witnesses or violators in traffic cases	3.5	4.0	3	1
73. Use mathematical formulas to calculate speed estimates in traffic crashes	2.0	3.0	9	3
74. Use mathematical formula to calculate speed estimates in traffic crashes	2.0	3.0	9	3
75. Watch traffic crash scene for theft or vandalism	3.5	3.0	3	3
76. Direct or control traffic with flashlight	3.5	2.0	3	5

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academi
77. Direct traffic by hand signals	3.5	2.0	3	5
78. Direct or control traffic with illuminated baton	3.5	2.0	3	2
79. Direct or control non-routine congested traffic	3.3	2.0	4	5
80. Direct traffic at scheduled times and places	3.3	2.0	4	5
81. Direct traffic under emergency conditions	3.5	2.0	3	5
82. Issue citations to pedestrians who violate traffic laws	3.3	3.0	4	3
83. Issue parking citations	3.5	3.5	3	2
84. Manually control traffic lights	2.0	2.0	9	5
85. Remove vehicles that obstruct traffic flow	3.0	4.0	5	1
86. Discuss traffic cases with judge or prosecutor	2.5	3.0	7	3
87. Prepare report or case folders on traffic cases	2.8	3.0	6	3
88. Review case prior to appeal court	1.8	2.5	10	4
89. Review report prior to testifying in court on traffic cases	3.0	2.5	5	4
90. Review testimony after traffic court appearance with prosecuting attorney	2.3	1.5	8	6
91. Testify in court on traffic cases	3.3	3.0	4	3

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academi
92. Advise city planners on traffic engineering needs	1.0	.5	13	
93. Advise city planners on traffic planning	1.0	.5	13	
94. Calculate roadway or intersection capacity	.5	.5	15	
95. Conduct traffic counts with automatic recorder	0.0	0.0	17	
96. Decide on the location for installing traffic control signs	18	0.0	14	
97. Draw diagrams of physical conditions at roadway intersections or segments (other than for traffic crashes)	2.3	1.5	8	6
98. Make manual traffic volume counts at assigned locations	1.3	.5	12	8
99. Observe and record driver obedience to traffic control devices	2.0	.5	9	8
100. Observe and record pedestrian counts at assigned locations	.8	.5	14	8
101. Observe and record traffic conflict or near-miss incidents and situations at assigned locations	.8	.5	14	8
102. Report hazardous roadway conditions and defective traffic control devices directly to the Municipal Traffic Engineer	2.5	.5	7	8
103. Report hazardous roadway conditions and defective traffic control equipment to supervisor	2.3	2.0	8	5

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academie
104. Report malfunctioning traffic control devices to the State Highway Engineering Officer	2.0	2.0	9	5
105. Request the installation of traffic control	1.0	1.5	13	6
106. Request the installation of traffic pavement markings	1.0	1.5	13	6
107. Request the installation of traffic signal devices	1.0	1.5	13	6
108. Calculate average accident rates	.5	1.0	15	7
109. Conduct special studies of accident records	1.5	1.0	11	7
110. Identify high accident frequency locations	2.0	2.5	9	4
111. Observe high accident frequency locations to identify factors contributing to high accident rates	1.8	2.5	10	4
112. Prepare accident statistical data	1.5	.5	11	8
113. Transmit accident statistical data to city department responsible for traffic engineering	.5	.5	15	8
114. Transmit accident statistical data to state highway engineering office	0.0	1.0	17	7
115. Transmit accident statistical data to supervisor	0.0	2.5	17	4
116. Transmit crash diagram and condition diagram summaries to city department responsible for traffic engineering work	.5	0.0	15	9

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
TRAFFIC LAW ENFORCEMENT & INVESTIGATION	Community Colleges	Police Academies	Community Colleges	Police Academie
117. Transmit crash diagrams and collision diagram summaries to state highway engineer	.5	1.5	15	6
118. Use compiled accident reports to prepare crash (collision) diagrams and condition diagram summaries for high accident locations	.8	1.0	14	7

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Following are the combined responses of community colleges and police academies to section I of the questionnaire Traffic Law Enforcement and Investigation.

Task Inventory	Arithmetic Mean	Ranking
1. Plan and direct selective traffic enforcement work	2.2	11
2. Supervise adult school crossing guards	1.3	16
3. Supervise breakdown and study of traffic law enforcement and accident data	1.5	15
4. Supervise collecting traffic volume counts	.5	21
5. Supervise directing and controlling traffic	2.2	11
6. Supervise investigation of accidents	2.7	8
7. Supervise investigation of hit and run accidents	2.7	8
8. Supervise issuing of traffic citations	3.3	4
9. Supervise student safety patrol program	1.8	13
10. Supervise traffic case preparation	2.2	11
11. Supervise traffic case preparation	2.5	9
12. Suggest changes in traffic law enforcement patrol tactics	2.3	10
13. Participate in driver education courses in public or private schools	2.0	12
14. Provide traffic safety education courses in public or private schools	2.2	11

APPENDIX A

COURSE CONTENT SURVEY (Contd)

Traffic Law Enforcement and Investigation (Combined responses)

Task Inventory	Arithmetic Mean	Ranking
15. Administer field tests for intoxication (coordination tests, etc.)	3.7	2
16. Advise parents of childrens' violation of traffic laws	3.5	3
17. Apply first aid	3.0	6
18. Assist citizens with emergency cases	3.7	2
19. Check autos against stolen car list	3.3	4
20. Conduct airborne traffic surveillance	.3	22
21. Conduct traffic law enforcement patrols	3.0	6
22. Conduct off-street (out-of-view) observation for traffic law violators	1.7	14
23. Conduct open observation for traffic law violators	3.3	4
24. Interview pedestrian traffic law violators	3.3	4
25. Interview traffic law violators	3.3	4
26. Issue citations for mechanical defects on motor vehicles	2.3	10
27. Issue moving traffic citations	2.8	7
28. Issue moving traffic citations to bicycle riders	2.7	8
29. Issue warning tickets	2.8	7
30. Operate radar to identify violators of speed laws	1.7	14
31. Patrol freeways	2.0	12
32. Work driver license check points	1.5	15

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Traffic Law Enforcement and Investigation (Combined Responses)

Task Inventory	Arithmetic Mean	Ranking
33. Call for supplementary aid (e.g., wreckers, fire department) for traffic crashes	2.8	7
34. Carry traffic crash victims to hospitals	3.2	5
35. Check crashed vehicles for evidence of mechanical defects that contributed to crash	2.7	8
36. Clean up traffic crash scene to the extent necessary to prevent debris becoming a traffic hazard	3.5	3
37. Collect traffic crash evidence	3.7	2
38. Conduct follow-up on hit and runs	2.7	8
39. Conduct preliminary investigation on hit and runs	2.7	8
40. Contact next-of-kin in traffic crash investigations	2.5	9
41. Control spectator access to traffic crash scene	3.7	2
42. Determine key or crucial events related to the traffic crash	3.5	3
43. Determine point(s) of impact or point(s) of occurence	3.3	4
44. Determine secondary collisions or secondary points of impact in traffic crashes	2.3	10
45. Diagram and record measurements of traffic crash scene	3.0	6
46. Dispose of personal property following a traffic crash investigation	2.3	10

APPENDIX A

COURSE CONTENT SURVEY (Condt.)

Traffic Law Enforcement and Investigation (Combined Responses)

Task Inventory	Arithmetic Mean	Ranking
47. Estimate driver(s)' capability to drive	3.6	6
48. Follow-up on nature and extent of personal injuries resulting from traffic crashes	2.0	12
49. Interview victims and those involved in traffic crash	3.3	4
50. Interrogate traffic law violators involved in traffic crashes	3.3	4
51. Investigate traffic crashes associated with aggravated assault	2.5	9
52. Investigate traffic crashes associated with commission of a crime	2.5	9
53. Investigate traffic crashes reported late	3.0	6
54. Locate, interview, and establish credibility of witnesses to traffic crashes	3.0	6
55. Move (or arrange for moving) damaged vehicles	3.3	4
56. Photograph accident scene	2.7	8
57. Prepare narrative reports on traffic crashes	2.8	7
58. Protect traffic crash evidence for collection	3.5	3
59. Record driver(s)' condition and appearance	3.8	1
60. Record location and description of skidmarks, glass, and broken off parts in traffic crashes	3.5	3

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Traffic Law Enforcement and Investigation (Combined Responses)

Task Inventory	Arithmetic Mean	Ranking
61. Record location of traffic control devices	2.8	7
62. Record motor vehicle damage in traffic crashes	2.8	7
63. Record nature of sight obstructions	2.8	7
64. Record visibility conditions at time of accident	3.3	4
65. Record type and condition of road surface	3.3	4
66. Request assistance from traffic crash investigations squad	2.5	9
67. Request mechanic to test vehicles involved in traffic crash	2.2	11
68. Request witnesses or violators to submit written reports or accounts of occurrence in traffic crashes	2.5	9
69. Reroute or direct traffic around traffic crash scene to prevent further crashes or injury	3.5	3
70. Send traffic crash evidence to lab for analysis	3.3	4
71. Survey or cause to have surveyed accident scene	2.7	8
72. Take statements or depositions from witnesses or violators in traffic cases	3.7	2
73. Use mathematical formulas to calculate pavement friction factors in traffic crashes.	2.3	10

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Traffic Law Enforcement and Investigation (Combined Responses)

Task Inventory	Arithmetic Mean	Ranking
74. Use mathematical formulas to calculate speed estimates in traffic crashes	2.3	10
75. Watch traffic crash scene for theft or vandalism	3.3	4
76. Direct or control traffic with flashlight	3.0	6
77. Direct traffic by hand signals	3.0	6
78. Direct or control traffic with illuminated baton	2.3	10
79. Direct or control non-routine gested traffic	2.8	7
80. Direct traffic at scheduled tines and places	2.8	7
81. Direct traffic under emergency conditions	3.0	6
82. Issue citations to pedestrians who violate traffic laws	3.2	5
83. Issue parking citations	3.5	3
84. Manually control traffic lights	2.0	12
85. Remove vehicles that obstruct traffic flow	3.5	3
86. Discuss traffic cases with judge or prosecutor	2.7	8
87. Prepare report or case folders on traffic cases	2.8	7
88. Review case prior to appeal court	2.0	12
89. Review report prior to testifying in court on traffic cases	2.8	7

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Traffic Law Enforcement and Investigation (Combined Responses)

Task Inventory	Arithmetic Mean	Ranking
90. Review testimony after traffic court appearance with prosecuting attorney	2.0	12
91. Testify in court on traffic cases	3.2	5
92. Advise city planners on traffic engineering needs	.8	19
93. Advise city planners on traffic planning	.8	19
94. Calculate roadway or intersection capacity	.5	21
95. Conduct traffic counts with automatic recorder	0.0	23
96. Decide on the location for installing traffic control signs	.5	21
97. Draw diagrams of physical conditions at roadway intersections or segments (other than for traffic crashes)	2.0	12
98. Make manual traffic volume counts at assigned locations	1.0	18
99. Observe and record driver obedience to traffic control devices	1.5	15
100. Observe and record pedestrian counts at assigned locations	.7	20
101. Observe and reocrd traffic conflict or near-miss incidents and situations at assigned locations	.7	20
102. Report hazardous roadway conditions and defective traffic control devices directly to the Municipal Traffic Engineer.	1.8	13

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Traffic Law Enforcement and Investigation (Combined Responses)

Task Inventory	Arithmetic Mean	Ranking
103. Report hazardous roadway conditions and defective traffic control equipment to supervisor	2.2	11
104. Report malfunctioning traffic control devices to the State Highway Engineering Officer	2.0	12
105. Request the installation of traffic control signs	1.2	17
106. Request the installation of traffic pavement markings	1.2	17
107. Request the installation of traffic signal devices	1.7	14
108. Calculate average accident rates	.7	20
109. Conduct special studies of accident records	1.3	16
110. Identify high accident frequency locations	2.2	11
111. Observe high accident frequency locations to identify factors contributing to high accident rates	2.0	12
112. Prepare accident statistical data	1.2	17
113. Transmit accident statistical data to city department responsible for traffic engineering	.5	21
114. Transmit accident statistical data to state highway engineering office	.3	22
115. Transmit accident statistical data to supervisor	.8	19
116. Transmit crash diagram and condition diagram summaries to city department responsible for traffic engineering work	.3	22

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Traffic Law Enforcement and Investigation (Combined Responses)

Task Inventory	Arithmetic Mean	Ranking
117. Transmit crash diagrams and collision diagram summaries to state highway engineer	.8	19
118. Use compiled accident reports to prepare crash (collision) diagrams and condition diagram summaries for high accident locations	.8	19

APPENDIX A

COURSE CONTENT SURVEY

SCALE: 0 = irrelevant 1 = a few will learn 2 = many will learn
3 = most will learn 4 = essential

Task Inventory	Arithmetic Mean		Ranking	
COMMUNITY RELATIONS	Community Colleges	Police Academies	Community Colleges	Police Academies
1. Develop disaster control plans	1.0	0.5		8
2. Develop plan for organizing crowd control units or operations	1.8	0.5	7	8
3. Prepare and present speeches	2.3	4.0	5	1
4. Write press releases for review by superior officer	1.8	2.0	7	5
5. Direct community relations programs	1.3	1.0	9	7
6. Participate in driver education courses in public or private schools	0.3	2.0	12	5
7. Provide traffic safety education to the public	0.5	2.0	11	5
8. Escort parades	1.8	2.0	7	5
9. Escort dignitaries	0.8	2.0	10	5
10. Escort wedding or funeral processions	0.8	2.0	10	5
11. Control spectators at civil disturbances	1.5	3.0	8	3
12. Communicate with labor and management over strike disturbances	1.5	0.0	8	
13. Implement restraining order against strikers	1.3	1.0	9	7
14. Obtain restraining order against strikers		1.0	13	7

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
COMMUNITY RELATIONS	Community Colleges	Police Academies	Community Colleges	Police Academies
15. Physically restrain members of either party to a strike	1.5	1.5	8	6
16. Work at scene of strikes	1.8	0.5	7	
17. Communicate with leaders of demonstrations	1.3	2.5	9	4
18. Implement restraining order against demonstrators	1.5	2.5	8	4
20. Physically restrain demonstraters	1.8	3.5	7	2
21. Work at scene of demonstrations	1.8	3.0	7	3
22. Answer calls on domestic quarrels and brawls	2.0	2.0	6	5
23. Answer civil complaints and refer to appropriate agagency	3.5	2.0	1	5
24. Answer request for aid (i.e., sick calls)	3.0	4.0	3	1
25. Assist out-of-town visitors	2.8	3.0	4	3
26. Assist stranded motorist	3.3	3.0	2	3
27. Check homes of people on vacation	3.5	1.5	1	6
28. Handle mentally ill persons	3.3	3.5	2	2
29. Investigate consumer complaints	1.5	1.5	8	6
30. Investigate repossession complaints	1.3	1.5	9	6

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
COMMUNITY RELATIONS	Community Colleges	Police Academies	Community Colleges	Police Academies
31. Receive complaints on city services	2.0	1.5	6	6
32. Run errands and deliver messages	1.8	0.0	7	9

APPENDIX A

COURSE CONTENT SUPVEY

SCALE: 0 = irrelevant 1 = a few will learn 2 = many will learn
3 = most will learn 4 = essential

Task Inventory	Arithmetic Mean		Ranking	
CRIMINAL LAW	Community Colleges	Police Academies	Community Colleges	Police Academies
1. Supervise criminal case preparation	2.3	0.7	7	7
2. Supervise preliminary investigations	2.4	1.3	6	5
3. Supervise follow-up investigations	2.4	1.3	6	5
4. Advise suspects of their legal and civil rights	3.4	4.0	2	1
5. Fill out suspect interrogation card	1.7	1.3	10	5
6. Interrogate suspects with aid of partner	2.4	1.3	6	5
7. Interrogate suspects or witnesses with aid of polygraph	0.9	0.0	11	8
8. Interrogate suspects in the field	2.4	3.3	6	3
9. Interrogate suspect in the station of office	2.4	3.3	6	3
10. Study background, rap sheet, and M.O. of suspects prior to interrogation	2.1	3.0	8	4
11. Vary method of interrogation based on suspects' background, cultural differences	1.9	4.0	9	1
12. Discuss criminal cases with defense attorney	3.4	1.3	2	5
13. Discuss criminal cases with prosecutor	3.6	3.3	1	3

APPENDIX A

COURSE CONTENT SURVEY (Contd.)

Task Inventory	Arithmetic Mean		Ranking	
CRIMINAL LAW	Community Colleges	Police Academies	Community Colleges	Police Academies
14. Prepare charge for magistrate	2.7	1.3	4	5
15. Prepare criminal case folders	2.4	1.0	6	6
16. Prepare criminal case summary sheet for prosecutor	2.6	1.3	5	5
17. Prepare physical evidence for submittal in court	3.4	4.0	2	1
18. Prepare to testify in court on criminal cases	3.4	4.0	2.	1
19. Present charge before magistrate	2.4	3.7	6	2
20. Review testimony after criminal court appearance with prosecuting attorney	3.0	2.3	3	3
21. Testify in court on criminal cases	3.6	4.0	1	1

EXPLORING THE NEED FOR OCCUPATIONAL COMPETENCY MEASURES

TASK FORCE COMMITTEE POSITION PAPER

SECRETARIAL FIELD

May 21, 1974

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Literature on the Certified Professional Secretary examination (CPS Capstone, CPS Study Outline and Bibliography for the 1974 Certified Professional Secretary examination, The CPS Examination: A Sampling of Questions, The Certified Professional Secretary Examination Frequently Asked Questions & Answers, and a copy of Part V of the 1973 Communications & Decision Making Test Booklet for the CPS Exam) was brought by the representative of the Dean of the Institute for Certifying Secretaries (Cynthia Brummond) and distributed to all members for review. In addition, the Task Force reviewed statistics provided by the U. S. Bureau of Labor including average annual openings and employment prospects to 1980. A rapid employment growth is anticipated in the secretarial/steno field with the best opportunities for those with steno skills. It is expected there will be 247,000 average annual openings in the field.

DELINEATION OF THE FIELD

Definitions brought to the attention of and reviewed by the Committee in their attempt to define the term "secretary" are listed below.

Those used by the Career Service Authority in The City and County of Denver, Colorado, are as follows:

Secretary A - Performs secretarial duties for a top level executive or a person responsible for a major functional or geographic operation. Does work of a confidential nature and relieves principal of designated administrative details. Requires initiative, judgment, knowledge of company practices, policy and organization.

Secretary B - Performs secretarial duties for a member of middle management. General requirements are the same as for Secretary A, but limited to the area of responsibility of the principal.

Stenographer - Transcribes from dictating equipment, or records and transcribes shorthand dictation involving a normal range of business vocabulary. May perform copy typing or clerical work of moderate difficulty incidental to primary stenographic duties. May operate as a member of a centralized stenographic area. May perform the secretarial function for a small group.

General Clerk A - Performs complex and responsible clerical duties requiring independent analysis, exercise of judgment and a detailed knowledge of department or company policies and procedures. Minimum supervision required.

DELINEATION OF THE FIELD Continued

Those used by the Mountain States Employment Council are as follows:

Secretary, Executive - In addition to acting as a highly skilled stenographer and typist, relieves a major division manager, branch manager or other company official of many administrative details. Handles confidential files and materials, makes appointments and travel arrangements, assembles data for and prepares complex reports, and composes routine correspondence. Handles many problems without referring them to the executive, and performs a responsible liaison function between him and his other employees or other departments. May frequently take independent action. Works under general supervision. Exclude secretaries to company presidents.

Secretary - In addition to acting as a stenographer and typist, makes appointments, sorts work, and makes minor decisions for an executive. Handles routine problems without consulting with the executive. Distinguished from secretary, executive in that employee has more limited range of responsibilities.

Stenographer - Takes dictation in shorthand of correspondence, reports and other matter, and transcribes dictated material. Arranges letters of various lengths in proper form, using correct grammar, sentence structure, punctuation, etc. Distinguished from a secretary in that employee does not make appointments for an executive before instructed to do so, or make minor decisions for an executive. May transcribe machine dictation.

DELINEATION OF THE FIELD Continued

The definition presently used by National Secretaries Association is: A Secretary shall be defined as an executive assistant who possesses a mastery of office skills, who demonstrates the ability to assume responsibility without direct supervision, who exercises initiative and judgment, and who makes decisions within the scope of assigned authority.

It was the opinion of the Committee that the word "secretary" is more frequently misused than not. As an example, of 138 individuals in a given organization only nine meet the definition of a secretary as defined by the National Secretaries Association. It was further agreed that access to confidential information was a critical element in the definition of the most professional level in the secretarial field.

In general the Task Force agreed, however, that the definition of secretary as used in the Dictionary of Occupational Titles appeared to conform to the most universally accepted definition, although the majority of the Task Force was unaware of the existence of the Dictionary of Occupational Titles. The definition reads:

Secretary (clerical) 201.368. girl friday; secretarial stenographer. Schedules appointments, gives information to callers, takes dictation, and otherwise relieves officials of clerical work and minor administrative and business detail: Reads and routes incoming mail. Locates and attaches appropriate file to correspondence to be answered by employer. Takes dictation in shorthand or on Stenotype machine (STENOTYPE OPERATOR) and transcribes notes on typewriter, or transcribes from voice recordings (TRANSCRIBING-MACHINE OPERATOR). Composes and types routine correspondence.

DELINEATION OF THE FIELD Continued

Files correspondence and other records. Answers telephone and gives information to callers or routes call to appropriate official and places outgoing calls. Schedules appointments for employer. Greets visitors, ascertains nature of business, and conducts visitors to employer or appropriate person. May not take dictation. May arrange travel schedule and reservations. May compile and type statistical reports. May supervise clerical workers. May keep personnel records (PERSONNEL CLERK). May record minutes of staff meetings.

Excerpted from page 635, Dictionary of Occupational Titles, 1965, Volume 1, Definitions of Titles, Third Edition.

IDENTIFICATION OF NEEDS

While the growth of the secretarial field is continuing, job restructuring occurs with automation. Duties vary with changes in our society and with the development of word processing techniques. Under the newer management techniques a secretary is part of a team who works with and not for others.

An easily available, accessible competency exam would open up opportunities for continuing education for those denied or who previously found it impossible to obtain. In a survey undertaken for the Commission on Non-Traditional Study by the Educational Testing Service, it was found that 80 million people said they wanted to learn more about something.

If individuals could receive college credit for occupational competency this, for some, would be the incentive needed to go forward with more formal education. Availability, accessibility and cost are important considerations in continuing education for the majority of adults in this country. Never the less, a competency measurement would provide, for some individuals, the vehicle to encourage the pursuit of college level courses and provide the individual with the incentive to move up the career ladder.

Members of the Task Force agreed that most individuals pursue certificates or a method of occupational competency measurement to prove they excel in their field. It has a direct relation to their field of employment. A competency exam which would relate to the individuals particular need would probably be used because the individual could understand and visualize what it is doing for him.

IDENTIFICATION OF NEEDS Continued

It was agreed that a standard diagnostic test would be very helpful to encourage employees to up-grade themselves and their skills, would aid business in complying with Equal Employment Opportunity Commission requirements, and in some instances could be used as a substitute for employee-employer appraisals.

If competency measures could be standardized and the program universally used throughout the U. S., it would be valuable since there is a significant movement of people around the country. We demand performance standards for other items in our daily lives -- aspirin, autos, buildings, bridges -- but we have never been able to apply a similar standard to formal education.

Estimates of potential growth were discussed but the Task Force concluded that it would take a more analytical search to arrive at any firm data for projected increases in the work force. Current estimates, depending on definitions, place the total in excess of three million persons. Another complicating factor is the recognition that in the total "secretarial" work force, many so employed are contented individuals desiring no further training or education, being quite content to function as they are at their present level.

IDENTIFICATION OF AVAILABLE RESOURCES

ASPA - American Society for Personnel Administration

ASTD - American Society for Training and Development

BOCEC - Business and Office Career Education Curriculum, Department of Vocational Education, Colorado State University, Fort Collins, Colorado

Contact: Dr. Harry Huffman, Director

CSA - Career Service Authority, City and County of Denver, Colorado

CALS - Colorado Association of Legal Secretaries

ETS - Educational Testing Service, Princeton, New Jersey

Federal Civil Service - Following is the description of a booklet shared by Marianne Stroo:

AN2400 R 3

Federal Office Assistant Examination: Stenographer, Typist, Clerk, and Office Machine Operator

What it is, and how it is given

United States Civil Service Commission

Washington, D. C. 1969

LaBarre, James E., Ph.D. Dissertation, University of North Dakota, 1974 - "The Relationship of Personal and Academic Factors to Predictability of Performance on the Certified Professional Secretary Examination"

MSEC - Mountain States Employer's Council, Inc. - possibly has survey of company sponsored educational programs. Contact: Mr. Dick Wright
Executive Vice President

NALS - National Association of Legal Secretaries - has Professional Legal Secretary examination known as PLS.

IDENTIFICATION OF AVAILABLE RESOURCES Continued

NOCTI - National Occupational Competency Testing Institute (Now based at ETS)

NSA - National Secretaries Association, International, 2440 Pershing Road, Suite C 10 Crown Center, Kansas City, Missouri 64108, sponsors the Institute for Certifying Secretaries which has the CPS, Certified Professional Secretary, examination; also sponsors a Future Secretaries Association and a FSA scholarship test directed to business education students including post secondary.

NSA has participated in three studies in 1973:
"Market Segmentation of Airline Advertising: Is the Business Secretary Being Ignored by the Airlines?"
"Relationship of Selected Personal and Academic Factors to the Predictability of Performance on the 1973 CPS Examination"
"The Effects of Office Technology and Office Systems and Procedures on the Job Descriptions of Selected Secretaries in NSA"
and plans an additional study of "Survey of Unions and Job Action Trends" in the near future.

An attempt is being made to make the CPS Program worldwide by providing nationalized versions. For the first time, a Spanish translation of the CPS exam will be given in Puerto Rico in May, 1974, and the 1974 Canadian version will be given in French as well as English.

To provide individuals who have earned the CPS rating with an opportunity to continue their professional growth, a special committee of the Institute for

IDENTIFICATION OF AVAILABLE RESOURCES Continued

Certifying Secretaries is determining the feasibility of developing specialty examinations.

Reed, Marrow, Brunson Associates, 200 Filmore Street, Denver, Colorado - has battery of psychology tests used for employees in business and industry. The case study approach is used and scores are computed to general basis of population in field for which examination is given.

WIC - Women in Construction - has exam.

SUGGESTED PROCEDURES FOR IMPLEMENTATION

The Task Force recommended that competency based examinations be developed based upon performance and behavioral objectives in six categories at two levels for each area for the secretarial profession and the Certified Professional Secretary examination be used as the third or ultimate step of the competency measurement. The two examinations to be developed would be (a) at a level for the achievement expected upon completion of an initial course at the college level in the six selected areas and (b) at a level for the achievement association with marketable skills/knowledges. The CPS exam is beyond these levels and requires more knowledge and experience.

The six categories would include the following:

1. Shorthand/transcription (This would eliminate the need for a typing exam)
2. Machine transcription (Would be appropriate for those in word processing)
3. Machine calculation (To include touch operation plus application of business problems)
4. Communications (To include English, decision making, human relations)
5. Clerical/secretarial procedures (To include filing, telephone techniques, data processing, duplication/copying machines, and office procedures as abases to administrative management)
6. Record keeping (Preparation and maintenance of business records)

In designing the test for level one and two, the three kinds of learning involved need to be recognized

a. Psycho-motor (skills)

b. Cognitive (exposure to knowledge and theory)

c. Affective (anything with simulation - human relations, psychology)

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

Designing performance objectives for the psycho-motor areas was deemed the most suitable and beneficial method for measuring competency in those areas. Multiple choice could be another method of testing in applicable categories.

The in-basket approach could be used as a partial method in the clerical/secretarial procedures category. The examinee would be expected to have knowledge of the four basic systems of filing and the alphabet. In the communications category for level one and two, case problems relating to human relations (psychology) could be used with foil responses. Examples of theory could be used BUT OMIT THEORY TERMINOLOGY. Among other methods of testing in this section, examinee could be asked to compose a letter.

Committee members felt it would be necessary to be cautious in testing for logical behavior as high test scores in logic generally indicate a dull and/or rigid individual who either sees "black or white". This trait is generally not found in those who are people oriented such as a secretary and, if so, are not suitable individuals for motivating others, so we should not aim to produce high achievement individuals in logic.

Other recommendations by the Task Force Committee were:

A bibliography, study outline and sample questions, and test format should be provided potential examinee for optional use. (So as not to confine examinee's knowledge to the items on the exam, it was recommended that past examinations not be provided; if the bibliography and study outline are used the knowledge gained by the potential examinee will be much broader.)

SUGGESTED PROCEDURES FOR IMPLEMENTATION Continued

An individual pursuing college credit in the areas of the competency measurement devices have the option of taking one or more tests at one or all levels, based on existing competencies (and qualifications for the CPS), it is up to the student to determine whether he/she would start at level one, two, or CPS.

Colleges are encouraged to award degree credit in the areas of the competency measurement instruments to candidates who demonstrate competency in the field at any of the three levels.

Each area of each examination level should be roughly comparable to the course content and the credit hours of formal education usually awarded by the individual college for similar study.

It was recommended that the promotion and implementation of testing programs should be housed at non-profit organizations/associations and/or agencies. Specifically, the Task Force had in mind those who are concerned with the secretarial profession, among them NSA and ETS, and that such groups be approached to coordinate the development of the above objectives.

Further time may need to be devoted to possible exploration of assessment in terms of the method of testing for levels one and two, particularly in the communications category or affective areas. The Task Force did, however, suggest a number of related disciplines that should be included in the assessment of occupational measurement in the secretarial field: Environmental relationships, economics of

APPENDIX A

The CPS Program (first administered in 1951) is sponsored by National Secretaries Association (International) which was founded in 1942; however, one does not have to be a member to take the CPS exam.

The CPS exam is a two-day timed examination administered by the Institute for Certifying Secretaries and given once each year at designated testing centers throughout the United States, Canada, Puerto Rico, Germany, Formosa, and Bermuda.

The examination covers six sections:

Part I ENVIRONMENTAL RELATIONSHIPS IN BUSINESS

Individual psychology, group dynamics; focusing on fundamentals of one's own needs, motivations, nature of conflicts, essentials of supervision, etc.

Part II BUSINESS AND PUBLIC POLICY

Business law; pertaining to contracts and bailments, insurance, negotiable instruments, real property, government regulatory legislation, etc.

Part III ECONOMICS OF MANAGEMENT

Includes subject areas of applied economics, principles of management, and elements of business operation. Management of personnel, finances, production, and marketing are also examined.

APPENDIX A Continued

Part IV FINANCIAL ANALYSIS AND THE MATHEMATICS OF BUSINESS

Managerial Accounting, fundamental statistics, and interpretation of accounting records involved in business management are covered in this section.

Part V COMMUNICATIONS AND DECISION MAKING

Ability to establish priorities, composing and typing responses, as well as one's skills in editing, listening, abstracting, judging work acceptability and follow up are tested in this portion.

Part VI OFFICE PROCEDURES

Covers data processing, records management, knowledge of library reference materials, communications media, duplication processes, mail handling, executive travel, conferences and meetings, and principles for writing original business communications, etc.

All sections of the exam must be completed within a five-year period or the examinee must retake all six parts and begin another five-year period.

All sections are scored by machine except Part V, Communications and Decision Making, and they are working toward a method to enable it to be machine graded also. This portion not yet scored by machine is graded by experienced secretarial science teachers at the college level who are accustomed to grading this type examination.

APPENDIX A Continued

All testing centers are approved prior to designation as are potential examinees. Information given on applications is verified prior to examinee being accepted as qualified to take the exam.

Students graduating from two and four-year degree programs may sit for the exam within twelve months of receipt of same but they will not be granted their certification until they have completed the experience required for certification.

For the purpose of evaluating experience no period of less than three months of continuous employment will be counted.

Qualifications for taking the examination are:

High School graduation or equivalent plus a minimum of three years verified secretarial experience, one of which must have been for twelve months continuous with one employer within the past five years (Must have two years additional secretarial experience for each year of High School not completed); total experience must be within past 25 years.

Associate Degree graduates must have a minimum of two years verified secretarial experience, one of which must have been for twelve months continuous with one employer within the past five years, and the total experience within the past five years.

APPENDIX A Continued

Four-year college graduates requires twelve months of accumulative verified secretarial experience within the past five years.

Business educators wishing to sit for the exam must have a minimum of twelve months accumulative secretarial experience within the past 10 years.

Members of the Institute and those composing the CPS exam include: 6 education members, 2 CPS members, 2 management members, 4 CPSs from the local area (or districts), the Canadian Associate, an International NSA officer, and the examination consultant (Dr. George Satter, North Carolina) who passes judgment on exam questions and assists in writing their format. (At this point, the Task Force suggested that CPS exam questions should be phrased so as not to indicate gender.)

Fifty percent of the questions are changed each year with the exception of Part V (Communications and Decision Making) which is changed 100%. The test is sealed when it is presented to the candidate. Examinee breaks seals of each section and reseals upon comoletion. Examinee is approved by Institute as qualified to sit prior to test date and each is assigned a number. This number appears on the cover sheet of the exam and is the identification of the examinee. EACH test sent from the Institute and received by the proctor of the exam bears one of the identified numbers. The proctor does not see the contents of the exam with the exception of Part V. All papers not to be returned in connection with the exam and in possession of examinee during Part V are collected by proctor and destroyed.

APPENDIX A Continued

Due to a promotional effort during 1973 to encourage more colleges and universities to grant credit to individuals who hold the CPS rating and offer some form of recognition for the CPS Program, the list of those offering credit and some form of recognition has doubled during the past year.

As of February 1, 1974, there were 2,289 new applicants for the CPS examination; of this number, 192 were student applications. Including retakes, there were a total of 3,859 applications.

Government recognition of CPS Certification, at present, includes:

Transportation Systems Center of the Department of Transportation in Cambridge, MA, grants two-step advancement upon completion of CPS Certification.

University Civil Service System of IL and FL accepts CPS Certificate in lieu of Civil Service Examination. (In IL - it has to have been obtained within last five years prior to application.)

States of Maine and Tennessee grant automatic pay increases.

U. S. Federal Government cites CPS in GS-313 of the Qualifications Standards as being qualification which may be considered as additional factor and used to award bonuses for rating purposes.

APPENDIX B

A current list of institutions presently giving degree credit for the CPS are:

GREAT LAKES DISTRICT (National Secretaries Association, International)

Central YMCA Community College Chicago, IL	32 credit hours
Dominican College Racine, WI	32 credit hours
Detroit College of Business Dearborn, MI	24 credit hours
Eastern Michigan College Ypsilanti, MI	
Indiana University Fort Wayne, IN	24 credit hours
International Junior College Fort Wayne, IN	40 credit hours
Lake Michigan College Benton Harbor, MI	
Lansing Community College Lansing, MI	20 credit hours
Milwaukee Area Technical College Milwaukee, WI	25 credit hours
Southern Ohio College Cincinnati, OH	

NORTHEAST DISTRICT (National Secretaries Association, International)

Allentown Business School Allentown, PA	
Corning Community College Corning, NY	38 credit hours
Elmira College Elmira, NY	36 credit hours

APPENDIX B Continued

Hofstra University Hempstead, NY	
New York State University Agriculture & Technical College Farmingdale, NY	28 credit hours
Niagara Community College Niagara Falls, NY	27 credit hours
Villa Maria College Cheektowaga, NY	27 credit hours

NORTHWEST DISTRICT (National Secretaries Association, International)

Augustana College Sioux Falls, SD	37 credit hours
Brigham Young University Provo, UT	
Community College of Denver Denver, CO	60 credit hours
Edmonds Community College Lynwood, WA	34 credit hours
Lower Columbia College Longview, WA	40 credit hours
Muscatine Community College Muscatine, IA	29 credit hours
Spokane Falls Community College Spokane, WA	
University of Alaska Anchorage, AK	25 credit hours

SOUTHEAST DISTRICT (National Secretaries Association, International)

Baltimore College of Commerce Baltimore, MD	32 credit hours
Broward Community College Fort Lauderdale, FL	24 credit hours

APPENDIX B Continued

Catawba Valley Technical Institute Hickory, NC	89 credit hours
Dabney S. Lancaster Community College Clifton Forge, VA	45 credit hours
Dekalb College Atlanta, GA	
Dekalb Community College Clarkston, GA	20 credit hours
Old Dominion University Norfolk, VA	
Oksloosa-Walton Jr. College Niceville, FL	
Polk Community College Winter Haven, FL	30 credit hours
Thomas Nelson Community College Hampton, VA	45 credit hours
University of Tennessee Knoxville, TN	24 credit hours
Virginia Western Community College Roanoke, VA	45 credit hours

SOUTHWEST DISTRICT (National Secretaries Association, International)

Brazosport College Freeport, TX	
College of Emporia Emporia, KS	
Eastern Arizona College Thatcher, AZ	27 credit hours
Golden West College Huntington Beach, CA	30 credit hours
Kansas City Kansas Community College Kansas City, KS	

APPENDIX B Continued

Los Angeles Harbor College Wilmington, CA	20 credit hours
Pepperdine University Los Angeles, CA	